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Project management education, training, working & learning : A longitudinal study into the experiences of British army officers in UK defence projects

Project Management Education, Training, Working & Learning:

a longitudinal study into the experiences of British Army officers in UK defence projects

William Edward Egginton

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Forty Four Thousand Eight Hundred and Ten Words

Abstract

This dissertation presents the findings of research undertaken to identify the benefits arising over time from Project Management (PM) Education and Training (E&T) at the level of the individual and the barriers that hinder the realisation of wider organisational benefits in the workplace. The research adopts a longitudinal, mixed methods approach and includes an extensive review of the relevant literature pertaining to two key themes of interest, namely, views on the current approaches to PM E&T and secondly, consideration of learning in a complex, dynamic, project-centric workplace. The data set comprised an original sample of 78 Army officers, all male and at the rank of Major but from a number of different regiments. Data collection started at the time of their PM course at the UK Defence Academy (June 2008) and ran over a 15 month period as they moved into posts in defence projects. The research has identified a range of beneficial changes at the level of the individual together with a number of barriers that were found to hinder the application of learning for the wider benefit of the employer organisation, the UK Ministry of Defence (MOD). Four key barriers are identified and described. The research concludes that whilst there continues to be merit in traditional courses in PM E&T, there is a real need for alternative approaches that better support further learning and project delivery in complex, dynamic, project-centric environments. The research findings suggest that development initiatives built on traditional taught elements alone are inadequate, principally as a consequence of factors beyond the control and influence of the individual student and practitioner. The thesis argues that the project team constitutes the most significant unit of project performance, working within an environment shaped by the wider organisation. Only when due consideration is made of these other levels of learning - as part of a coherent approach to the development of genuine 'corporate competence' - will the benefits from individual learning class room based PM E&T initiatives be fully realised.

Dedication

In memory of my Mum and Dad, who both passed away during the early stages of this project, but who I know, would have been 'chuffed' and I think, very proud to have seen it at its conclusion.
We all miss and love you both.

Acknowledgements

I am indebted to Professor Sally Thomas for her insightful advice during the course of this dissertation and to the many students involved – all active serving Army officers – for giving up their valuable time to support the project.

I'd also like to thank my wife Jan, for helping me to think of the questions and for bringing me that drink when struggling with the answers.

But most of all, I'd like to thank my three fantastic sons
Tom
Ben
Sam
who provided me with the motivation to start and to finish,
if only to realise what it was that I was going on about for all that time.

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Author's Declaration

I declare that the work in this dissertation was carried out in accordance with the Regulations of the University of Bristol. The work is original, except where indicated by special reference in the text, and no part of the dissertation has been submitted for any other academic award. Any views expressed in the dissertation are those of the author.

SIGNED:..... DATE:.....

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GLOSSARY

AET Acquisition Employment Training

AOF Acquisition Operating Framework

AP Academic Provider

APM Association for Project Management

APMP APM Professional Qualification

APM-PQ APM Practitioner Qualification

BoK Body of Knowledge

BOS Bristol Online Surveys

BS British Standard

BTC Battle space Technology Course

CADMID Defence project life cycle

CDS Cranfield Defence & Security

CM Capability Manager

CoP Community of Practice

CPP Chartered Professional Person

CS Capability Sponsor

CU Cranfield University

DA Defence Academy

DEC Director of Equipment Capability

DE&S Defence Equipment and Support

DIS Defence Industrial Strategy

DLO Defence Logistics Organisation

DLOD Defence Lines of Development

DoD US Department of Defence

DPA Defence Procurement Agency

DTR Defence Training Review

EVM Earned Value Management

FLC Front Line Commands

GAO Government Audit Office (US)

GSoE Graduate School of Education

HR Human Resources

HeFA Higher Education for Acquisition

ICSC(L) Initial Command and Staff Course (Land)

ILS Integrated Logistics Specialist

IPMA International Project Management Association

IPTL Integrated Project Team Leader

MOD Ministry of Defence

NAO National Audit Office

NCO Non-commissioned Officer

OGC Office of Government Commerce

P3M Project, Programme and Portfolio Management

PM Project Management

PMI Project Management Institute

PPM Project and Programme Management

PRINCE Project Management in a Controlled Environment

PTL Project Team Leader

R&D Research and Development

RE Royal Engineers

REME Royal Electrical and Mechanical Engineers

RF Research Finding

RM Requirements Manager

RQ Research Question

S&T Science and Technology

SO1 Staff Officer 1 (Lt Col and equivalent)

SO2 Staff Officer 2 (Major)

TechET Technical Employment Training

TL Team Leader

TLCM Through Life Capability Management

PM Project Management

PMI Project Management Institute

S&T Science and Technology

SO1 Staff Officer 1 (Lt Col and equivalent)

SO2 Staff Officer 2 (Major)

TechET Technical Employment Training

"Perhaps the most valuable of all education is the ability to make yourself do the thing that you have to do, when it ought to be done, whether you like it or not; it is the first lesson that ought to be learned; and however early a man's training begins, it is probably the last lesson that he learns thoroughly".

Thomas H Huxley (1825 – 1895)

CHAPTER ONE

INTRODUCTION

1.1 Background

The role of the British Army in respect of their normal operational duties is generally well known. Military operations in Iraq and most recently, Afghanistan, makes that role very clear. Not so well known is the important role Army officers play in supporting defence projects aimed at the acquisition of new or enhanced defence capability in line with defence policy and operational needs.

A key conclusion of the last Strategic Defence Review (SDR) (MOD 1998) was the need for modern and effective armed forces equipped and supported for rapid and sustainable deployment. This operational need places demands on the people and projects that must acquire, deliver and sustain that capability[1]. The Defence Industrial Policy (MOD 2002) and again the Defence Industrial Strategy (MOD 2005) both emphasised an overarching imperative of modern defence: the need to provide the armed forces with the equipment[2] they require, on time, and at best value for money for the taxpayer.

It was against this background that the Defence Training Review (DTR) (MOD 2001) directed the formation of an integrated training and education system aligned to operational and business needs. The DTR noted that the newly formed Defence Academy, established in 2002, would provide a strong focus for management and technology education.

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[1] 'Capability' in defence terms is achieved through a combination of so-called 'Defence Lines of Development' or DLODs. These DLODs are: Training, Equipment, People, Infrastructure, Doctrine, Organisation, Information and Logistics – the acronym of TEPIDOIL.

[2] Equipment is but one DLOD, albeit the most expensive and most tangible element of capability. This statement, though made relatively recently, has since been acknowledged to be incomplete.

In parallel with the DTR, the Review of Officer Career Courses (ROCC) conducted a needs analysis which led to reforms in military officer career training and education. Important in the context of this research was the ROCC recommendation that officers taking up roles in acquisition should receive 'relevant management training' and project management was acknowledged as a key area to be addressed. This recommendation resulted in the need for a new course - to become known as Technical Employment Training (TechET) – and it is this taught course that provides both the context and the data set for this research. Further details of the course are provided in Section 1.3.5.

1.2 Research Rationale

1.2.1 General

"Today's defence projects are over budget by £35 billion and arrive five years later than expected".

Sunday Times, August 23rd 2009

There is a paradox in project management today affecting education and training and delivery, and it is this: *despite growing interest and investment in project management education and training, project managers continue to make the same mistakes as they did 20, even 30 years ago* (see for example Hartman 2008; Suikki, Tromstedt et al. 2004; O'Mahoney, Vye et al. 2007).

Measures of project performance and success typically comprise three elements: time (was the project delivered to the agreed schedule?), cost (was the project within the approved budget?) and quality (were the project deliverables or outputs in line with the original user requirement or contract?).

Some have stated (NAO, 2009; Gray, 2009) that the performance of defence projects against these three criteria is not acceptable and there is a real and substantive need to improve project performance recognised by government, the general public and of course, the project management profession, represented in the UK by the Association for Project Management (APM). One could also argue that such criticisms are not limited to the defence sector.

The following table helps to illustrate the point:

Project	Planned		Actual	
	Cost	Duration	Cost	Duration
Holyrood[3]	£40m	4 years	£431m	7 years
Wembley[4]	£320m	4 years	£757m	9 years
A380[5]	£10.7Bn	6 years	>£13Bn	8 years
Astute	£2.6Bn	7 years	£3.8Bn	11 years
Nimrod MRA4	£2.8Bn	7 years	£3.5Bn	14 years
Type 45	£5.5Bn	8 years	£6.6Bn	11 years

Table 1.1 Recent performance of major defence and non-defence projects

Moreover, these problems are not unique to the UK. In March 2006, the US Government Accountability Office reported (GAO 2006: 3):

> *This is our fourth annual assessment of weapon programs. It contains our assessment of 52 weapon programs representing a projected investment of about $850 billion. Unfortunately, our assessments do not show appreciable improvements in the acquisition of major weapon systems. Rather, programs are experiencing recurring problems with cost overruns, missed deadlines and performance shortfalls.*

In 2001, the top five US weapon systems were projected to have a combined cost of about $290 billion. By 2006, this figure had almost doubled to $550 billion. Interestingly, the GAO report points to the need for a more 'knowledge based approach' to acquisition with greater emphasis[6] on 'knowledge points' reflecting confidence in 'product and process maturity' (GAO 2006: 10).

It is important to acknowledge the otherwise obvious fact, namely, that it is people that do project work and as such, their education and training clearly has a bearing on what they do, and how they do it and therefore, arguably, the project end result (see for example El-Sabaa 2001; Sauer and Reich 2009).

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[3] See for example http://www.parliament.uk/commons/lib/research/briefings/snpc-03357.pdf
[4] See Wembley National Stadium Project: Into Injury Time, July 2002
[5] Figures for defence projects are taken from the NAO Major Projects Report (2007)
[6] The GAO advocates 3 knowledge points: (1) Resources and Needs match; (2) Product design is stable and (3) Production processes are mature. Program Managers assure control through the capture of relevant product knowledge as a basis for decision making.

That said, projects are delivered by teams, not individuals, working not in isolation, but rather as part of a wider corporate setting and organisation. Defence is, of course, no exception. The benefits from an investment in an individual's project management education and training can only be realised within the context of a much wider business context.

The overarching rationale for this research, therefore, was to better understand the perceived contribution of project management education and training to project work at the level of the individual and then to explore the experiences of those individuals as they transition to the work place and go on to work in project related roles. In this way, any 'barriers' that frustrate, or possibly prevent, the realisation of benefits from such learning resulting in improved performance might be identified, together with any opportunities there might be to enhance effective learning in the work place. A better, evidence based understanding of these issues and opportunities would, or could, assist in informing organisational and people development initiatives, both now and in the future.

Academic concepts of relevance to the research therefore include not only 'the learning organisation' (Senge 1990, 1994) and 'workplace learning' (Eraut and Hirsh 2007; Eraut 2006, 2007) but also 'communities of practice' (Wenger, McDermott et al. 2002), 'situated learning' (Lave and Wenger 1991) and 'organisations as complex systems' (Stacey 1996, 2003).

1.2.2 Local

The rationale here comprises two key elements:

1. The defence sector and in particular, the performance of the MOD in delivering defence projects with budgets under increasing pressure; and
2. The project management profession and its ongoing efforts to gain chartered status and what this may mean for practitioner development.

In March 2008, the House of Commons Defence Committee[7] had this to say:

[7] House of Commons Defence Committee Report (p.6), 11th March 2008

> *The up-skilling and training of Defence Equipment & Support[8] Staff in specialist skills such as project management will be crucial to the future effectiveness of defence*

With the defence budget already stretched at £36bn and current commitments in major projects such as Trident replacement, Future Carrier and Eurofighter, the affordability of the Defence Programme is likely to be placed under even closer scrutiny. A commitment given by the newly elected Government is to conduct a Strategic Defence Review early in its term of office. This will inevitably shed an even brighter light on troubled defence projects and highlight the need for urgent and far reaching action to improve performance and 'value for money'.

Understanding the issues associated with poor project performance and the means to address a number of related issues through more effective people development, is, therefore, likely to continue to be of importance. Doing 'more of the same' one could argue, is not an option, a situation recognised by MOD and already being reflected in changes to MOD policy and practice and emerging as new demands on Cranfield University at the Defence Academy.

To that end, this research project has attracted the support of MOD in the form of both active sponsorship, through Major General Chris Wilson[9], and funding as part of the Defence Academy's Directed Research Programme. Interim reports produced in March 2009, September 2009 and January 2010 have been well received by senior staff at the Defence Academy and elsewhere in MOD[10].

The second consideration relates to the status of the project management profession, represented in the UK by the Association for Project Management (APM). Submissions were made to Privy Council during 2009 which, if successful, will significantly enhance the profile of project management through the award of chartered status resulting in the arrival of the Chartered Project Professional (CPP).

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[8] Defence Equipment and Support (DE&S) is the MODs main agency for equipment procurement. Further details are provided in Section 1.3.

[9] At the time of project launch, Major General Wilson CBE was Capability Manager (Ground Manoeuvre) and Sponsor of Technical Employment Training. His letter supporting this research is at Appendix A.

[10] The reports are tabled at the Military Acquisition Stream Executive Committee which represents key stakeholders in all matters relating to defence project management development.

A key factor in achieving and sustaining Chartered status is of course the credibility of associated professional qualifications offered up and accredited by APM. At present, the approach taken by APM, through its network of accredited providers, is first and foremost predicated on taught courses with assessment founded on the APM's Body of Knowledge (BoK). Some commentators (see for example Hinds 2004; Crawford 2006; Hartman 2008; Kaulio 2008) have expressed concerns around this approach and have challenged it as not necessarily being the 'right' approach to project management development. This research is intended to contribute to that debate.

1.2.3 Personal

The author joined Cranfield University at the Defence Academy in September 2004. With a background in project and programme management and practitioner experience of projects in engineering, construction, oil & gas and financial services sectors (but interestingly, not defence), the author soon found himself leading the design and development of a new masters level 'pre-employment training' course in defence related project management for British Army Majors. This was to become known as Technical Employment Training (Tech ET). As academic leader, the author remained heavily involved in the teaching and assessment of TechET through to May 2009, by which time over 350 Army Majors had 'graduated' prior to taking posts in defence projects[11]. TechET was very well received, so much so, that it resulted in a new requirement and the subsequent development of a successor course – Acquisition Employment Training (AET) – which was to be offered across all 3 uniformed services as well as the civil service. AET ran for the first time in May 2009, and now runs 5 times a year for a total of around 250 students.

By September 2009, with this research by then well under way, his teaching and related responsibilities took the author in other directions and he handed over responsibility for the AET project management lead to others at Cranfield.

[11] TechET ran for the first time in June 2005, and between then and the arrival of AET in May 2009, there were seven courses with an average of 50 students per course. My research interest emerged in early 2008 and the two final TechET courses, which provide the data set for this research, were held in June and September of that year.

At a personal level, therefore, the rationale for this research was three-fold:

1. To identify opportunities to improve project management education and training for which the author was responsible;
2. To explore the perceived contribution of project management education and training to actual project management performance and practice, and
3. To better understand the 'state' of the project management education 'scene' from both a practitioner and academic stand-point.

In this respect, the literature on current approaches to project management education and training became of immediate interest. Work on understanding the value of project management (Thomas and Harden 2007; Thomas and Mengel 2008; Thomas and Mullaly 2008) and the views of other academics on taught course content and structure (Crawford 2000; Levene 2003; Smith and Winter 2005; Crawford 2006), research (Bredillet 2008) and teaching 'paradigms' (Pollack 2006) and pedagogy (Mintzberg 1990; Carbone 2004; Thomas and Mullaly 2008) were all considered relevant and as a result, feature in the review of the literature conducted as part of this research.

At a personal level, there is of course, both the desire and the need to publish and the author naturally believed that here was an important and topical theme that might result in outputs worthy of publication. There is a school of thought – which as a matter of interest includes a number of colleagues at Cranfield - that believes too much of project management teaching and 'good practice' is, put simply, practitioner-led and not sufficiently 'academic' nor indeed, research-based. Here was an opportunity, he believed, to engage in that debate and provide robust research findings that would contribute to ongoing discussion.

To that end, in December 2009 the author submitted a paper based on the preliminary findings of his research to the US Project Management Institute (PMI) for consideration as part of their 2010 Conference on Project Management Education and Research, held in Washington DC. The paper was subsequently accepted by the Editorial Board for publication and presentation at the Conference (Egginton, 2010).

1.3 Project Management Education and Training (PM E&T) in Defence

1.3.1 Definitions

The British Standard for Project Management, BS6079 (BS 2000) defines a 'project' as:

> *A unique set of controlled and coordinated activities with definite starting and finishing points undertaken by an individual or organisation to meet specific objectives within defined time, cost and performance parameters.*

and 'project management' as:

> *The planning, monitoring and control of all aspects of a project and the motivation of those involved in it to achieve the project objectives on time, and to the specified cost, quality and performance.*

Projects, as such, have existed since before the times of the great pyramids. However, *project management* as a separate management discipline is a relatively new phenomenon, emerging after the Second World War and enjoying a surge in popularity since the 1970s. A more complete overview of the emergence of Project Management (PM) as a separate management discipline follows in Chapter 2.

1.3.2 Origins in Defence

In the UK, Project Management had its origins in the chemical industry just prior to World War II but only gathered real momentum in the early 1950s (Morris and Hough 1991). The term 'project management' was first used by the US Air Force in 1953, and Admiral Raborn is credited with establishing the first project office in the shape of the Special Projects Office for the Polaris project in 1955. Contractors looking to participate in the project were required to adopt formal project management techniques[12]. The development and application of such techniques contributed to the successful testing of Polaris in 1965. In 1968, the arming of the first Polaris submarine - HMS Resolution – represented a very visible milestone for the discipline. Project Management in defence had arrived.

[12] At that time, this essentially involved adopting Project Evaluation and Review Technique (PERT) for project scheduling and critical path analysis.

1.3.3 Recent Developments

The aforementioned Strategic Defence Review (MOD 1998) triggered the creation of the Defence Procurement Agency (DPA) and the Defence Logistics Organisation (DLO) and crucially at the same time, a move away from functional structures to project based structures centred on what were referred to as 'integrated project teams' (IPTs).

The introduction of SMART Acquisition in 2003/4, its associated life cycle[13] and supporting processes, all made available through the Acquisition Management System (AMS) and its successor the Acquisition Operating Framework (AOF), underlined the importance of project management as a key discipline within the defence sector. In April 2007, and as a result of the Defence Industrial Strategy (DIS), the defence agency organisations, DPA and DLO, were merged to form Defence Equipment and Support (DE&S). Based in Bristol, DE&S employs around 22,000 people and, with an annual budget of £16Bn, is the MOD's principal agency for the procurement and support of defence equipment. In April 2009, a new Project and Programme Management (PPM) Centre of Excellence was established in DE&S and, by 2010, PPM was well established as a core competence for MOD with a comprehensive Project Management Development Programme (PMDP) based on the APM suite of qualifications.

1.3.4 Cranfield University's Role

Cranfield University (CU) is the contracted Academic Provider (AP) to the Defence Academy of the United Kingdom, and as such is responsible for the development, delivery and assessment of all MOD educational programmes at the Shrivenham campus. Working within the auspices of the College of Management and Technology (CMT), Cranfield Defence and Security (CDS) provides post-graduate education on a wide range of management and technology subjects to full time and executive students who are in the main serving military officers and civil servants drawn from all parts of the MOD: DE&S, Front Line Commands (FLC) and the Capability Sponsor (CS).

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[13] Life Cycle: the phases of a project from its inception to completion. CADMID - Concept, Assessment, Demonstration, Manufacture, In Service and Disposal – is the MOD Project Life Cycle.

In addition to these master level programmes, CU is also responsible for a wide range of short courses aimed at ranks[14] from Army Major to Major General including Higher Education for Acquisition (HEfA) courses and the researcher's own Defence Strategic Programme and Portfolio Management course.

1.3.5 Technical Employment Training

Technical Employment Training (Tech ET) was[15] an 8-week course attended by Army Majors about to embark on posts in acquisition with the stated aim:

> *To prepare selected officers for Grade 2 technical staff appointments by applying a common understanding of the skills and processes required in the delivery of capability through all stages of the Defence Acquisition process*

The course ran for the first time in June 2005 and thereafter twice a year through to September 2008 by which time over 350 students had 'graduated' prior to taking up project related roles in various parts of the MOD organisation. The course comprised two 4-week phases: Phase 1 focussed on Systems Engineering and Project Management, and Phase 2 involved completing a team-based project assignment.

Phase 1 of TechET culminated in students preparing for and taking the Association for Project Management Professional (APMP) exam, a foundation project management qualification accredited and awarded not by CU, but by the UK professional institute, the Association for Project Management (APM).

This research uses a data set which comprises students drawn from two TechET cohorts: 4a (June 2008) and 4b (September 2008). Although two cohorts, this population is treated as a single data set as described in Chapter 3.

1.4 Aim of the Research

The overall aim of the research is:

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[14] Ranks given here are Army based. Equivalent ranks for Major are Squadron Leader (RAF) / Lt Commander (RN) and are generally referred to as SO2 level. For Major General, the equivalents are Air Vice-Marshal (RAF) and Rear Admiral (RN) generally known as 2* (spoken two 'star') level.
[15] TechET has since been superseded by AET as explained in Section 1.2.3. See Appendix B for details.

To ascertain the perceived contribution of Project Management Education and Training received during TechET, to the successful delivery of defence projects and to determine the barriers in the work place, if any, that may frustrate or prevent the realisation of those benefits.

The over arching structure and logical flow of the dissertation is illustrated below:

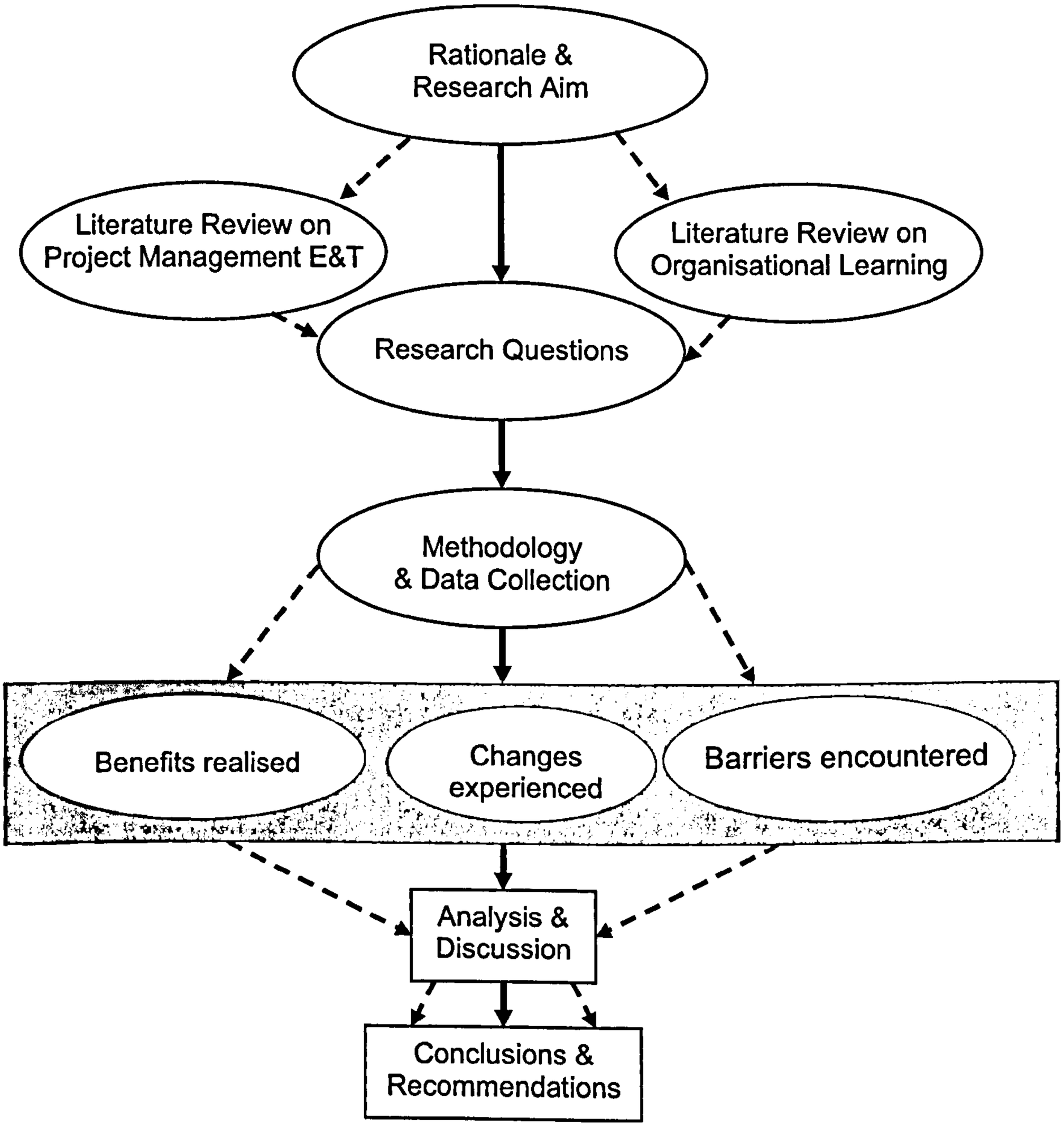

Figure 1.1: Research Framework

The overall timeline for the research was 31 months – from an initial proposal outlining the general rationale and research aim in January 2008, to finalisation and submission of the dissertation in August 2010. Data collection activities (given the longitudinal nature of the work) extended over a period of 18 months.

1.5 Objectives

The specific objectives of the research are to:

1. Present a critical review of relevant literature on Project Management (PM) Education and Training (E&T) and organisational learning;
2. Use primary research to identify and describe student perceptions of the changes brought about by a PM E&T intervention;
3. Evaluate the perceived benefits of such interventions to defence projects and the perceived barriers, if any, to realising the full benefits from PM E&T; and
4. Identify opportunities for improved policy and practice relating to the development of people working in defence projects.

1.6 Chapter One ~ Introduction: *Summary*

This Chapter has described the main themes that together form the context of the research and presented the rationale underpinning the research aim and objectives – in general terms, in respect of the defence sector and the project management profession and at a personal level. For each element of the rationale, and where appropriate, key concepts have been briefly introduced and the areas of relevant literature identified. An overarching framework for the dissertation has been outlined.

Central to this research is the premise that whilst Army officers entering defence related project roles require PM E&T, such courses alone are not sufficient to ensure improved performance in the workplace. Other variables come into play. These might be expected to include not only the PM E&T approach, content and structure, but also the nature of the project workplace and its environment. It is also worth noting here, that the research is not looking to make the case for the adoption of PM by the MOD, or to determine whether or not PM as such improves project performance. A fundamental assumption of the research, therefore, is that the implementation of PM, *per se*, brings benefits to organisations, as evidenced in the adoption of PM as core competence within the MOD.

The key questions that shaped the rationale for this research are therefore:

Q1. What are student views on the experience of their PM E&T?

Q3. What are the beneficial changes over time as a result of PM E&T?

Q4. What are the barriers over time to the realisation of benefits from PM E&T?

Q4. What can MOD do to improve its return on investment from PM E&T?

These questions are developed further as part of the conclusion to the Literature Review presented in Chapter 2. The Literature Review itself focuses on two key themes, emerging from the research rationale, and related to the research objectives, namely current approaches to project management education and training and consideration of organisational learning and learning in a workplace.

Chapter 3 describes the Research Methodology including details of the data collected and methods of analysis.

Chapter 4 presents Findings, both quantitative and qualitative, bringing together results from the various surveys and interviews conducted over the period of the study. The Research Questions are used to structure this chapter which concludes with a summary of the key findings.

Chapter 5, Discussion, is used to review and contrast the Research Questions, the Research Findings and previous research outlined in the Literature Review.

Finally, Chapter 6 summarises the key conclusions arising from the study and presents details of the contribution of the research to professional and personal knowledge and practice. This chapter also comments on limitations of the research and makes a number of recommendations including those relating to further research.

"Some books are to be tasted, others to be swallowed, and some few chewed and digested: that is, some books are read in parts, others to be read, but not curiously, and some few to be read wholly, and with diligence and attention".

Sir Francis Bacon (1561 - 1626)

"Can you tell me Socrates, whether virtue is acquired by teaching or by practice; or if neither by teaching nor practice, then whether it comes to man by nature, or in what other way?".

Plato as referenced in Jowett (1999)

CHAPTER TWO

A REVIEW OF THE LITERATURE

2.1 Introduction

Project Management (PM) is becoming established as a profession (Turner 2000), with its own Body of Knowledge (BoK) and professional institutions such as the UK's Association for Project Management (APM), the Project Management Institute (PMI) in the US and the Swiss registered International Project Management Association (IPMA)[16,17].

Project Management is now offered up as a subject of study at both undergraduate and post graduate certificate, diploma and masters levels, in both general and vocational related courses[18]. Details of other education and training offerings, including 1-day and 1-week, flexible and modular courses - most with some sort of accredited professional qualification attached to them - appear on a regular basis in the technical and professional press, including APM's own monthly magazine *Project*.

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[16] The Body of Knowledge of specific interest and relevance to this study is the UK's Association for Project Management (APM) Body of Knowledge (BoK). This is only one of several that current exist internationally including PMI's PMBOK.

[17] To quote the IPMA website (www.ipma.ch) 'IPMA® is a world leading non-profit making project management organisation and represents 50 project management associations from all continents at an international level'.

[18] Cranfield launched its MSc in Programme and Project Management in January 2007. Others are offered by Oxford Said Business School, and the Universities of Manchester, Lancaster and Southampton to name but a few.

Despite this recent and apparently relentless rise in popularity, there is no recognised development path for project managers (Thomas and Mengel 2008). Moreover, and perhaps as a consequence of project management's recent history, the education and training of project managers has not been the focus of extensive research efforts.

As one consequence of this, some have argued the need to extend the research to connect it more closely to the challenges of contemporary practice (Maylor 2006; Winter, Smith et al. 2006) and improve the profession's understanding and management of existing and emerging challenges. One response to this came in the form of the EPSRC funded initiative 'Rethinking Project Management' (Winter and Smith 2006). With a grant period of 24 months (2004-6), the aims were to create a new inter-disciplinary network of project management academics and practitioners and for that network to then define a research agenda aimed at extending the field of research beyond its current and 'rather shaky' foundations.

One of the objectives of the network[19], therefore, was to open up debate around general concerns arising from the fact that the APM BoK, and its related qualifications, had historically been developed by practitioners, for practitioners – without a solid research base underpinning what is presented as 'best practice'. There are concerns relating to current practice in project management training and education from what is believed to be an excessive focus on 'know what' (methods and tools) rather than 'know-how' ('craft knowledge'). These, and other views on current approaches to project management education and training interventions, form the basis of the first key theme of the Literature Review.

Another feature of the traditional approach to project management development has been a focus at the level of the individual. The vast majority of project management education and training interventions, at all levels, are designed, marketed and delivered to attract *individuals* for the duration of that intervention.

[19] The outputs of the network are further referenced below.

However, and as said already, projects are delivered not by individuals, but by teams with members drawn from various parts of the organisation and inevitably sitting within a wider business context and an environment shaped by corporate policy well beyond the control of the individual. The performance of the team and the nature of the corporate environment will inevitably impact on the contribution that any single individual is able to make. Given the very nature of project work, therefore, more appropriate development targets might be the project team, its local 'community' or even the corporate organisation and its executive. Learning in organisations, and specifically learning in a workplace shaped by a project-centric environment, therefore represents the second key theme of this Chapter.

Given that it is no exaggeration to say that an industry is evolving around project management education and training (Thomas and Mengel 2008) there is a need to establish some clear boundaries for the literature review. So, although there is reference to relevant US-based publications, the treatment of the education and training 'space' is limited to the UK situation. Moreover, the 'workplace' and 'environment' spans a multitude of management topics – strategy, leadership, change management and so on - so here too there will be a limit to the treatment of the literature to key areas of specific interest relating to learning and specifically, socio-cultural learning in the workplace.

Finally, the review is limited to 'project' and so avoiding the complications that would come with consideration of programme[20] and portfolio[21] both of which now form the basis of an increasing number of education and training courses and qualifications in their own right.

The following sections will present findings from the literature that clarify terminology, comment on current approaches to project management education and training, their alleged shortcomings and proposed alternatives, and provide an insight into the literature representing the nature, and associated challenges, of learning in the workplace.

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[20] Defined as a 'group of related projects' (BS6079).
[21] Defined as 'the total investment in projects, programmes and business as usual activities' (APM, 2005).

2.2 A Brief History of Project Management

"From Science comes Prevision, from Prevision comes Action".

Compte, 1896

"Business leaders and experts have proclaimed that project management is the wave of the future".

(Gray and Larson 2006)

A number of pioneers in the field of general management, up to World War II, have had a particularly powerful influence on the development of management theory. Frederick Taylor, an American engineer working in the Midvale Steel Works, concluded in his milestone publication (Taylor 1911) that scientific advancement had to go hand in hand with organisational development. Henri Fayol, a French mining engineer, analysed management activity into five elements – planning, organising, commanding (or directing), coordinating and controlling. His work (Fayol 1916) represented a first attempt at a complete theory of management. Elton Mayo, a Harvard professor, basing his work (Mayo 1933) on research rather than direct experience, was successful in shifting attention away from 'mechanistic' (the 'man as a machine metaphor' of Taylor) to issues relating to more so-called 'human factors'. Mary Parker Follett, an American educationalist, supported many of Mayo's conclusions and developed theories on, amongst other things, the importance of group processes in decision making (Follett 1949). No references to 'project manager' nor 'project management' were made in the work, and associated publications of any of these early management pioneers.

The post-war era saw a huge expansion in the volume of literature on management and the eventual emergence of project management as a separate management discipline. The Manhattan Project – development of the Atom Bomb – is often quoted as one of the earliest examples of modern project management but the term is still missing in its documented history (Morris 2009). Project Management (PM) as a term first appears in 1953 under procurement processes developed by the US Air Force. It was picked up and, as a result of their more hands-on approach, developed further by the US Navy

in taking forward the submarine-based missile system – Polaris – when work started in 1956. By 1960, the genesis of PM principles, including scope management, planning, monitoring, stakeholder management, a phased life cycle approach and the use of project offices, were all becoming well known and increasingly applied.

By the time of the Apollo programme and its aim of 'landing a man on the moon and returning him safely to earth' (to use President Kennedy's historic words of 1961) PM had truly arrived. It subsequently became the *de facto* way of working in NASA and the US Department of Defense (DoD). This in turn led to the establishment, in 1969, of the first (and now the world's largest) professional project management institution, the US Project Management Institute (PMI).

In the UK, PM had its origins in the chemical industry, again around the time of World War II (Morris and Hough 1991). The cancellation of the joint US/UK missile project - Skybolt – subsequently led to the 1962 Nassau agreement, in which the Americans agreed to provide Britain with details of the missile system – Polaris – and submarine technologies. The development of PM techniques as part of Polaris spilled over into UK practice and parlance and by the time the first of the Polaris submarines, HMS Resolution, was delivered, PM had established itself in the UK. The first professional body was founded as INTERNET UK in 1972 changing its name to the Association of Project Managers (APM) in 1975, and again, in 1999, to the Association for Project Management highlighting by that time, the growth of the discipline and a much more diverse membership.

Taking a more holistic view, Barron (2005) suggests three types of management prevalent today: *strategic* which addresses direction and purpose, *operations* as the repetitive day-to-day activities that provide revenue to businesses and *project management*, aimed at delivering effective change within an organisation. This typology is helpful in shaping the commentary that follows focussing as it does, on project management and in particular, approaches to the development of 'project people' and topics associated with organisational learning and learning in the workplace.

2.3 Terminology

2.3.1 Education and Training

It is convenient to make reference to 'education' and 'training' as an obvious and natural pairing. However, it is important to be clear on the difference since both exist, and both are indeed relevant to the research. The definitions[22] presented here based on the Ministry of Defence (MOD) view, which though not the only view, is arguably the most relevant in the context of this research.

The MOD[23] defines training as:

> *Activity that aims to impart the specific skills, knowledge and / or inculcate appropriate attitudes required by an individual in order to perform adequately a task or job.*

Put another way, 'training' involves applied, skill specific, practical periods spent learning in a one-way, structured environment with limited opportunity, or need for, questioning and constructive challenge. Training is generally regarded as vocational and relating to specific useful skills and forms the core of traditional apprenticeships and provides the backbone of content at technical colleges.

In contrast, 'education' is interpreted to mean a higher level of learning experience, one which encourages, indeed demands, deep understanding and the opportunity to challenge and question, to reflect and even philosophise. Education instinctively translates into a richer learning environment, one which is two-way and arguably more interactive and dynamic.

Again, to use the MOD definition:

> *The development of the intellectual capacity, the acquisition of general supporting knowledge and inculcation of attitudes, which underpin performance and engender understanding, commitment and ethos.*

Taken together, these definitions suggest that knowledge is gained from formal education, whilst skills are acquired through appropriate training.

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[22] The Oxford English Dictionary offers alternative definitions to the MOD versions presented here, namely *education* as 'structured extended programmes to impart knowledge and develop competence' and *training* as 'short courses to develop specific skills'. Both are consistent with MOD interpretations.
[23] Director General Education & Training: Strategic Plan, 2004.

Moreover, 'attitudes and behaviours' are generally believed to be developed out with education and training, for example, perhaps as 'a result of experiential application of knowledge' (Turner 2000).

These distinctions can be put into context using the example of teacher training. Prior to 1979, teacher training provision was driven by issues of cost as well as the need to match supply with demand (Maguire, Dillon et. al 2001) In 1979, policy making became more clearly political in nature and it was then argued that teacher training was more concerned with indoctrination that with education. The Education Reform Act (1988) and Green Paper, *The Government's Proposals for the Reform of Initial Teacher Training* (DfE 1993) stated that more teacher training should be moved into the school, and schools were charged with the professional preparation of teachers – a 'learning on the job' approach.

These reforms met with mixed responses, and have not been altogether successful for a variety of reasons, some of which resonate with the situation of project managers: a paradox that blames poor schools for performance but then seeks to train teachers in the very same institutions; the ability to attract and retain high quality recruits; a move towards performance related pay with objectives that are difficult to define and often even harder to measure.

Nevertheless, the effect of these reforms has been to reposition teachers as 'professional, competent and multi-skilled' (Maguire, Dillon et al. 2001) developed, accredited and qualified through a blend of on-the-job training and formal education with the opportunity to develop, along the way, the attitudes and behaviours needed to become 'complete professionals'.

To sum up, training involves 'doing' in relative isolation of any debate on the wider consequences and absolute meaning. Education, however, involves challenge, reflection and interpretation of meaning in a wider context. This is reflected in the views of an ex-Director of the Defence Academy: 'the greater the degree of uncertainty that our people face, the greater is their requirement for education" (Kiszely 2004).

2.3.2 Project 'Management' and Project 'Leadership'

Management and leadership constitute a further pairing of terms that requires clarification in order not only to determine the difference, but importantly to establish what might then be an appropriate response as part of any project related development programme.

It is usually the case, as has already been seen, that reference is made to project 'managers' rather than project 'leaders' and to the importance of project *management* development, rather than project *leadership* development. However, Kaulio (2008: 341) alludes to the need for both:

> *Management deals with more mechanical processes – planning, budgeting, controlling.....leadership focuses on vision, direction, motivation....where the (project) objectives are well defined, leadership tends to be secondary to management....as and when things change...there is a heavy bias towards the need for leadership.*

In a substantial review of 3500 articles and papers on project management, it was recognised that the "evolution of the project manager's role to demonstrate their ability as leaders and not just managers" was a key and important trend (Kloppenborg and Opfer 2002). Management might be considered to be mostly rational, establishing discipline around change, in contrast to leadership which is deeply emotional and facilitates continuity despite change. To be effective in delivering projects requires both. To that end, the APM BoK (Version 5, 2007) has a section entitled 'People and the Profession' that includes Leadership as a so-called 'soft skill' – along with communication, teamwork, negotiation and conflict management.

The important contribution of such 'soft skills' and in particular, that of the role of managers in both leading, and fostering leadership, in the context of delivering increasingly complex projects has been recognised and in many ways is shaping some of the emerging ideas relating to project manager development. Chapters 4 (Findings) and 5 (Discussion) will return to this topic. For the moment, it is sufficient to have drawn the distinction between 'management' and 'leadership' and to have established that both are relevant to project work.

2.3.3 Project Management Competence

Crawford (2000) has identified twenty four success factors as primary for successful projects. The competence of the project manager is one such factor. Consideration of the meaning of 'competence' is therefore important in the context of assessing the specific contribution of PM E&T to the development of competence more generally. A recognised definition of competence is provided by Spencer (1993: 114) namely:

> *An underlying characteristic of an individual that is causally related to criterion-referenced and/or superior performance in a job or situation.*

Moreover, there are said to be five characteristics of competence (Spencer 1993: 116), namely:

(a) *Motive*: Things a person consistently thinks about or wants that cause action;

(b) *Traits*: Physical characteristics and consistent responses to situations or information;

(c) *Self concept*; A person's attitudes, values or self-image;

(d) *Knowledge*; Information a person has in specific fields; and

(e) *Skills*: The ability to perform a certain physical or mental task.

The nature of each of these competence elements, the level to which each element has been developed and the contribution it is therefore able to make as part of a 'balanced' set of competencies, has practical implications for the performance of a project manager or leader.

Knowledge and *Skills* elements tend to be visible and relatively easy to develop (Alam, Gale et al. 2008). However, *Self-concept*, *Trait* and *Motive* elements are said to be 'more hidden', 'deeper' and 'central to personality (2008: 230) and therefore much harder, if not impossible, to develop using traditional taught methods. This is borne out in the fact that it is generally thought to be more cost effective to recruit for these elements of competence - given the time, effort and inherent difficulty in changing them - as compared with the more visible elements of competence.

2.3.4 The APM Competence Framework

The APM Competence Framework (APM 2008: 1) defines competence in the following way:

> *Competence articulates the expected outcome of performance standard that is achieved as a result of applying a combination of knowledge, personal attitude and skills and experience in a certain function.*

The APM Framework has been developed using the knowledge and experience of project management practitioners and "based on wide consultation among leading practitioners" (2008: ix). Whilst it states to have been based on "thorough research of a variety of competence frameworks" the Framework does not claim to have any empirical research-based underpinning. Nevertheless, APM suggest it provides UK organisations with "an ideal benchmark for developing organisation-specific frameworks" and to that end, it has been well received and is increasingly being adopted and adapted by project-based organisations, including the MOD.

The Framework defines the work of project management personnel, and allows for the identification and classification of what are believed to be the competence elements needed for effective project management by project managers at all levels within an organisation.

The APM has defined four Levels of Competence (Levels D to A) which are aligned to the International Project Management Association (IPMA) four-level structure[24]. The same competence elements apply at all Levels, but knowledge and experience are expected to grow deeper and broader from Level D to A. Three domains form the basis of a 'wheel of competence' namely: technical (30 competence elements), behavioural (9) and contextual (8).

Perhaps not surprisingly, by far the most voluminous in terms of the number of competence elements is the technical domain, and this domain essentially focuses on the 'knowledge and skills' competence elements found in the work of Spencer (1993). In the same way, APM's behavioural competence elements

[24] The 4 levels are: D: Certified Project Management Associate; C: Certified Project Manager; B: Certified Senior Project Manager; A: Certified Projects Director. See also http://www.ipma.ch

are broadly in line with Spencer's 'self-concept' and 'traits' characteristics, leaving APM's grouping of contextual elements as a cluster of 'bigger picture' headings[25].

The MOD has developed its own competence framework, based in part on the APM Framework. In many respects, one could argue that the focus for PM development in the British Army is primarily concerned with Knowledge and Skills, whilst working with, and within, the envelope of other competence elements that are, in many respects, pre-determined and for a large part, a given, for Army officers.

Nevertheless, for the purposes of this research, the APM Framework and related definitions of competence are helpful in providing additional context for PM E&T, the approaches to PM E&T and the subject of learning in the workplace - which of course, remain the primary focus.

2.4 Project Management Education and Training (PM E&T)

2.4.1 Historical Context

By the late 1960s onwards, some projects were failing precisely because they lacked project management (Morris 2009). Projects around at that time including Concorde, British Rail's Advanced Passenger Train, civil nuclear power[26] generation projects and North Sea oil & gas industry[27] projects, all faced massive challenges associated with stakeholder management, technology insertion, risk and uncertainty management as well as project definition and scope management. Studies commissioned in the US (see for example Peck & Scherer, 1962; Perry et al., 1969) and in the UK (e.g. Morris & Hough, 1987; Morris, 1994) highlighted typical causes and sources of difficulty.

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[25] One might argue, and some commentators have, that the 47 topics of the APM BoK have 'simply' been distributed across these three headings, and whilst this works at one level, it does beg the question 'was the BoK developed as a basis for a competence framework?' The view of the researcher is that it was not.

[26] The researcher should declare an interest here – his very first job as a recent graduate was as a Control & Instrumentation engineer on the construction of Heysham Nuclear Power Station (1979-81). He left long before its completion, but the project went on to be both a late and over budget.

[27] Having left the power station construction industry (Heysham) the researcher then spent 6 years in the Oil & Gas industry (1981-87). His final role was as project manager for an innovative well-head equipment project. Curiously enough, that project was delivered to time and cost.

Most of these factors (e.g. unclear success criteria, changing sponsor strategy, concurrency, unsupportive political environment) were found to fall outside of the standard project management curriculum, as expressed in textbooks at the time. However, it was precisely that curriculum that was, in 1983, formalised by PMI in its Body of Knowledge (PMBOK).

The UK's Association for Project Management (APM) followed a similar path but in light of the studies on project success and failure, considered the PMBOK as too narrow, and thus, in 1991, produced a broader document that gave recognition to a wider set of topics. This BoK was to become the basis for the IPMA Competence Framework, and of course, the APM's own Competence Framework as described earlier.

This history is important if only because it has influenced to a large extent the content and structure of many, if not most, of the project management education and training options that exist today.

2.4.2 The 'Value' of Project Management

Each and every education and training intervention has a cost[28] and with that cost, comes an expectation of 'benefit' to the sponsoring party. Work done on researching the value of project management to organisations (Thomas and Mullaly 2008) has found that the most common and traditional measure of 'value' (Return on Investment) is not helpful and therefore not systematically applied in justifying investment in PM related education and training.

Those companies that were able to demonstrate tangible value were found to be those that perform project work on behalf of their customers (Thomas and Mullaly 2008: 255) and these are typically either consulting or construction and engineering organisations where project work is the nature of their business.

[28] Although this is of course strictly correct, it can (and in the case of the MOD, does) happen that PM E&T is provided from 'internal agencies' using resources where the costs are seen as 'wooden dollars' i.e. simply internal transfers. The question might be asked as to whether or not this approach to funding E&T affects the sponsor's expectations of the benefits to be realised.

Organisations that are functionally structured or that do not deliver projects for customers are less likely to realise tangible benefits from PM (Thomas and Mullaly 2008: 260) and for these and most other organisations, it was generally accepted that the benefits from investment in education and training were 'intangible' and such investments were simply regarded as a "necessary investment in organisational[29] effectiveness" (2008: 351). The realisation of 'intangible benefit' was found to be greatest in organisations that had a higher level of maturity, and such benefits were found to include (2008: 352):

- Improvements in decision making
- Enhanced communications and collaboration
- Improvement in work cultures
- Alignment of approaches, terminology and values
- Overall effectiveness of the organisation, and
- Improved transparency, clarity of structures, roles and responsibilities.

Almost every organisation that participated in the research received some degree of value – tangible, intangible or both – as a result of investment in PM E&T (2008: 356). However, for many organisations there was no evidence of this value being sustained and in some cases, value was found to have declined or been destroyed over time. The reasons for this were found to be several and varied and included attitudes that perceived project management as being "done" and therefore requiring no further investment, changes in oversight by executives or parent organisations, the loss of key resources without consideration of the consequences and changes in conditions in the organisation.

Thiry (2004) poses a related question "how can the benefits of project management training programs be improved?" His research found that organisations implement PM training for two main reasons: firstly, as a reaction to specific triggers (such as customer feedback) or as part of a wide ranging organisational change programme. He goes on to draw two main conclusions:

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[29] It is interesting to note that the measure of 'value' is assessed at the level of the organisation whilst the intervention is typically delivered at the level of the individual – a point that the study returns to discuss later (Chapter 5).

(1) Strategic goals are not specifically identified as part of the project, and
(2) When goals are identified there are no clear measures of success.

Thiry suggests that organisations need to better understand the justification for training and have clearly identified its objectives and evaluation criteria – a finding entirely consistent with those of Thomas and Mullaly.

Organisations make significant investments in staff development without necessarily understanding the consequences of that investment on organisational effectiveness (Alam, Gale et al. 2008) a view endorsed by Irwin (1998) who states the need to ensure "the effectiveness of development activities is evaluated by analysing the change in behaviour that come about as a result of that development" (1998: 72).

2.4.3 Commentary on current approaches to PM Education & Training

As described above, the history of Project Management as a separate management discipline is by all accounts a relatively recent one, with a literature that dates back only to the 1960s and 1970s. The 'profession' is, in many respects, still in an embryonic state with a research base that is limited, but growing, as evidenced in Cranfield's own International Research Centre.

However, there is evidence in the literature of widespread and growing concern around the current approaches to taught project management education and training. Thomas and Mengel (2008) describe the current focus of taught PM E&T in the UK (and Europe) as being "training to the standards provided by the professional associations such as APM and PMI" (2008: 304). They contend that "this level of (class room based) education fails to prepare project management students to deal with the increasing complexity that they face in today's working environment" (2008: 305).

The same concerns are shared with professionals in the US. Pappas (2005) suggests that many training programmes are "failing to adequately teach the skills needed to manage the high-level projects companies are now implementing" (2005: 62).

One reason for this failure, Pappas suggests, is the apparent lack of 'integration management' where despite adequate project specific process, the wider consequences for other parts of the business such as human resources and quality are not fully considered. Her research also identified a further shortfall: *communication*. Projects rely on effective human interaction and collaboration from start to finish, and Pappas goes on to argue that "project managers need a deep, wide toolkit in communications" which includes areas such as effective questioning, active listening and communications analysis and assimilation (2005: 67).

Hartman (2008) quite literally adds another dimension in respect of developing the project manager's mind. Traditionally, he argues, project managers have been prepared by giving them a toolkit that includes a range of methodologies and perhaps some insight into human behaviour ('soft skills') with perhaps some attempt to integrate all of these through some form of experiential learning. However, Hartman suggests that virtually all of the APMP elements are predominantly left brain hemisphere oriented thinking logical and sequential thought processes and functions (2008: 262). Other factors that are predominantly right-oriented thinking and considered necessary are missing: to comprehend context, see the big picture, identify patterns and understand context. In respect of PM development Hartman concludes that "the primary missing ingredients have more to do with behaviours and the human condition than strictly with traditional project performance metrics" (2008: 264).

Pollack (2006) introduces the concept of 'hard' and 'soft' paradigms, a term that first came into popular usage following publication of *'The Structure of Scientific Revolutions'* (Kuhn 1970) Pollack maintains that the development of project management has been strongly influenced by the hard paradigm, commonly associated with a positivist epistemology[30], deductive reasoning and quantitative techniques. Practice based on the hard paradigm emphasises efficient, expert-led delivery and control against pre-determined goals.

[30] *Epistemology*: interpreted to mean 'how we come to know'. See also Section 3.1 for further elaboration of the importance of epistemology.

In contrast, the soft paradigm is commonly associated with an interpretive epistemology, inductive reasoning and qualitative techniques. Practice based on the soft paradigm "emphasises learning, participation, the facilitated exploration of projects and typically demonstrates an interest in underlying social processes" (Pollack 2006: 267).

Pollack illustrates his argument for a variety of project management related topics. For example, in respect of 'people and participation' he is "astonished" to find so little in the BoKs relating to human resource management (HRM) and that the application of HRM practices in project management is so rudimentary. In response to this, and at a practical level, he argues for greater consideration of the soft paradigm within the PM role especially given that "traditional understandings of the role of the project manager are being re-evaluated.....from an expert role to a facilitator role" (Pollack 2006: 270).

In a survey of US based PM graduate and certificate programmes, Carbone (2004) found that such courses "must be supplemented with other educational aspects to have a complete project manager development programme" (2004:15). Formal training, says Carbone, must be combined with experiential learning. He cites 'soft-skill' aspects as being particularly difficult to "train in a classroom". "Just as you cannot teach a person to swim in a classroom, so the manager cannot be developed in one" (Mintzberg 1990: 166). One response to this, suggests Carbone (2004: 17) is on-the-job training with mentoring and coaching for both newly appointed and trained project managers.

Crawford et al (2006) have described the current status of project management practitioner training and development as being akin to 'trained technicians', people who are expected to follow detailed procedures and techniques, prescribed by project management methods and tools. This is in contrast to what the authors believe is the real need, namely to "develop reflective practitioners who can learn, operate and adapt effectively in complex environments" (2006: 725).

Crawford advocates a move from 'prescription' to 'interpretation', from 'know-what' to 'know-how' to 'know-why' (2006: 718). In drawing heavily on the findings generated by the EPSRC Network activity over the period 2004-2006, and goes as far to say that PM associations may be "undermining their claims to professionalism if they imply that project management expertise can be codified as methodologies" (2006: 719).

In the outputs from the 6th Meeting of the EPSRC Network, Smith and Winter (2005) report on the need to shift mainstream thinking from forms of knowledge that can be addressed and disseminated through formal training courses, to non-mainstream thinking around 'craft knowledge' and 'know-how' which they say, cannot. The 'primary unit' of knowledge is the entity 'project' and whilst they say this is appropriate, they argue that the right interpretation should be *everything* concerned with how that entity should be organised and managed – and not just 'delivery'. The concerns about current practice that they express include:

- The excessive focus on what to do – methods and tools – rather than craft[31] knowledge;
- The dislocation between training, development and practice, and
- The excessive focus on knowledge acquisition at the expense of capability[32] development.

They conclude that learning and development should be more integrated with people's work situations and professional activity and viewed as a 'social process' in which the individual is able to integrate learning with the development of the organisation and its practices – along the lines of 'the apprentice' mode of learning, which they say, is now rarely adopted. A similar point is made by Levene (2003) who argues that PM can become an enabler of competitive advantage provided it embraces both delivery of projects and continuing learning and development at the level of the organisation.

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[31] Craft knowledge includes: development of high performance teams, handling of change, motivation, talent management, reading situations, handling complexity, professional judgement and intuition.
[32] 'Capability' is said to involve a range of aspects: different forms of knowledge, experience and personal attributes such as ability to learn and tolerance of uncertainty.

Finally, and along a similar line of reasoning, Bredillet (2008) refers to projects as "vehicles to develop competencies (individual, team and organisational)" but sees the traditional view of applying a Body of Knowledge (BoK) to known situations to solve problems as being "inadequate when responding to unknown situations in a dynamic system" (2008: 239). He goes on to suggest that "the world sees project management from a positivist perspective" leading to "linearity and oversimplification when attempting to solve complex problems". It is only by treating project management as both an art and a science, and adopting an "integrative epistemological position" that the true nature of project problems can be understood[33].

2.5 Learning in the Workplace

2.5.1 Organisational Learning

Projects bring about change, and one of the objectives of project management is to learn the lessons that emerge as a consequence of each change. The project life cycle has within it a phase generally referred to as 'close-out', during which the team is expected to identify lessons learned for dissemination to the wider organisation. There is, therefore, the intent to 'learn'. Achieving 'learning' is, however, quite another matter.

Peter Senge in his book 'The Fifth Discipline' (Senge 1990) is widely acknowledged for his influence on the principles and practice of organisational learning. He created the concept of '*Systems Thinking*' as the fifth discipline to support his other four disciplines, namely:

- *Personal Mastery* – the discipline of continually clarifying and deepening personal vision and of seeing reality objectively;
- *Mental Models* – deeply engrained assumptions, pictures or images about how we understand the world and how we act;
- *Building Shared Vision* – the capacity to hold a shared picture of the future to create the goals then owned throughout and organisation;
- *Team Learning* – the ability of a team to function at a level greater than the sum of its parts – starting with genuine 'thinking together'.

[33] This line of argument is returned to later in Chapter 3, Research Methodology.

The work of Senge is of direct relevance in the context of project management and specifically, its learning processes. Levene suggests for example, that the fifth discipline embraces conceptual frameworks that have been said to "integrate and fuse these various elements into a coherent body: a helicopter view which, as it happens, is an important part of effective project management" (2003: 27).

In his successor publication (Senge 1994) an image is presented that brings together what the author refers to as the 'domain of enduring change' (or deep learning cycle) and the 'domain of action' (organisational architecture) in a way which is, to quote the author "more complete and more richly textured than can be seen from the 'five disciplines' alone" (Senge 1994: 42).

The image that emerges when these ideas are brought together produces a useful rubric for this research, providing as it does, a contrast between on the one hand, the 'tangible' aspects at play in the workplace e.g. tools and methods, and on the other, less tangible concepts e.g. attitudes and beliefs. The resulting 'triangle and circle' model is shown below.

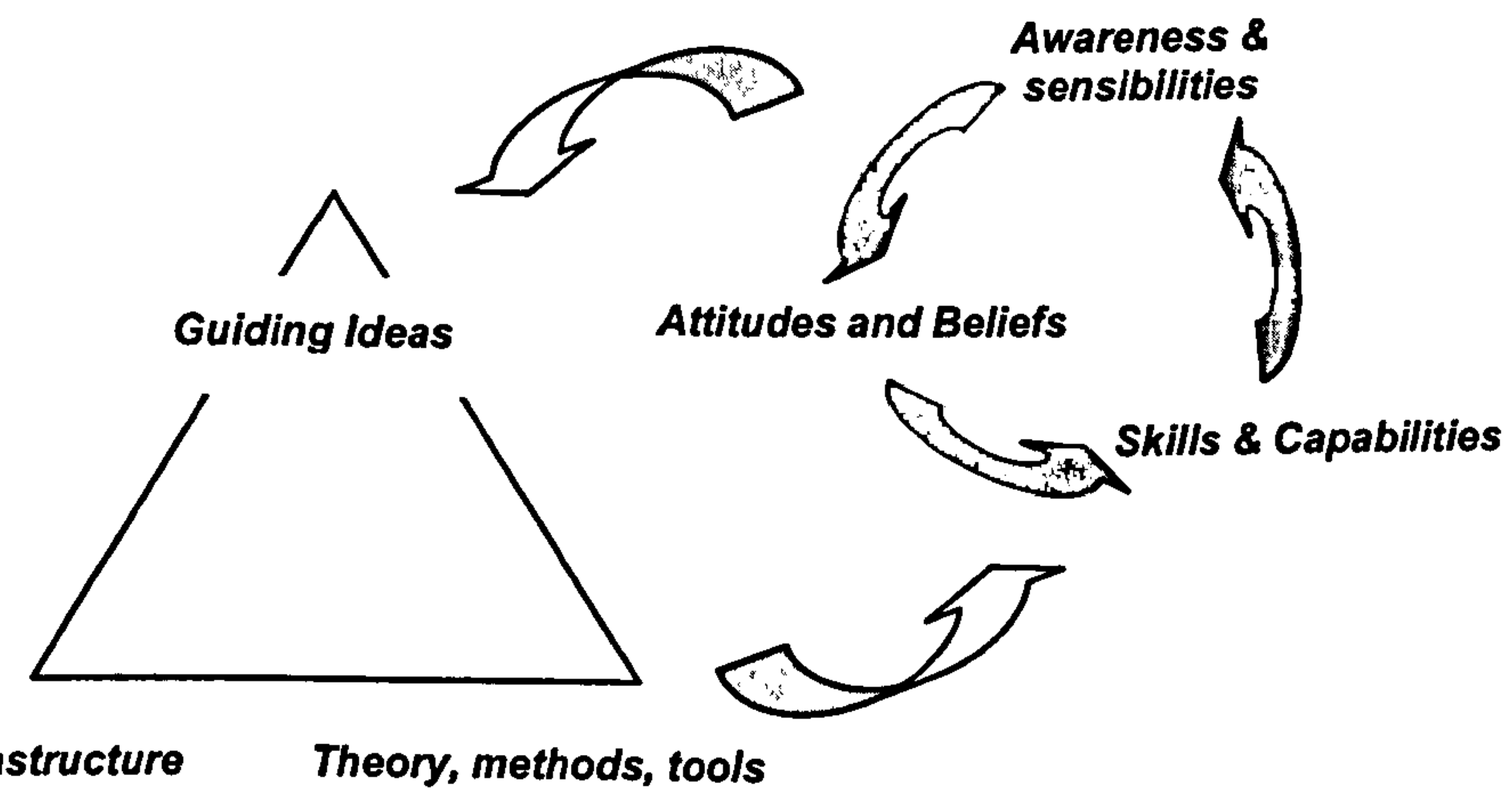

Fig. 2.1: Senge's 'Triangle and Circle' (Source: Senge 1994: 42)

In this model, so says Senge, the "key focus for activity is the triangle" whilst the "central causality" of change is the circle. Senge goes on to suggest that "we tend to assume that which is most tangible is most substantial, and that which is intangible is insubstantial. In fact, the opposite is true" (Senge1994: 40).

In other words, a focus on the triangle where changes can easily be made actually means that those changes are potentially (and often are) short lived. It is the circle of the "deep learning cycle" that endures and changes produced by this cycle, whilst difficult to make are said to be "often irreversible" (Senge 1994: 43). Despite this, it is these aspects of learning that all too often receive scant attention (and it follows, potentially little investment).

The relevance of this model to a project environment can be illustrated by drawing on the concept of the project life cycle, a fundamental feature of the project approach. In its simplest form, a project life cycle comprises a series of phases that enable change to be managed in a structured way from an initial idea, through to execution and completion. Levene (2003) highlights the fact that whilst all project lifecycles include a phase[34] intended for learning, very often such processes are poorly managed or superficially applied. The intent is for learning to be 'relevant and well-timed' but in reality, it is often neither. Individuals either fail to recognise a particular event or task as a learning opportunity or simply do not have the appropriate attitude to take time to learn.

2.5.2 Workplace Learning

Eraut has written extensively on the topic of learning by, and from, people in the workplace (Eraut and Hirsh 2007; Eraut 2006, 2007). His longitudinal study of early career professional learning[35] concluded that "the majority of learning was informal learning within the workplace itself" (2007: 408). This learning was mostly triggered by consultation and collaboration within the working group, akin to legitimate peripheral participation within a community of practice. The study went further in presenting a typology for early career learning comprising:

- Work processes with learning as a by-product;
- Learning activities located within work or learning processes, and
- Learning processes at or near the workplace.

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[34] For example, the APM lifecycle includes a phase called 'Post Project Review' and BS6079 makes clear reference to a Post Project Report. In the MOD, the equivalent process is called Learning From Experience (LFE).

[35] The study focussed on the first 3 years of employment of newly qualified nurses, graduate engineers and chartered accountants.

The study concluded that the majority of workers' learning occurs in the workplace itself. Formal learning contributes most when it is both relevant and well-timed, but still needs further workplace learning before it can be used to best effect (Eraut 2007: 419).

The research also concluded that senior managers have a major influence on workplace learning and culture that extends far beyond their job descriptions. Their role is to develop a culture of mutual support and learning, not to provide all the support directly themselves. Rather, they need to share this role with experienced workers, through some form of distributed leadership.

There is further evidence to support these findings from the literature. For example, Atkins and Gilbert (2003) found that a lack of effective process to ensure such 'mutual support' – in this case in the context of project team member induction – resulted in failures and issues for major clients. Sense and colleagues (2003) conclude that many projects present significant learning opportunities yet leaders fail to establish appropriate environment to recognise and embrace these opportunities.

2.5.3 Organisations as Complex Dynamic Systems

One form of learning is that which uses some form of repetition to push mental models into the unconscious where they can be recalled and used very rapidly. "The richer the store of unconscious models, the more expert the person". (Stacey 1996). Stacey refers to this as "single-loop learning" (1996: 59) and makes clear the dangers of this type of learning: the assumptions and simplifications upon which such mental models are built are taken for granted.

This, says Stacey (1996: 60) "is highly efficient in stable circumstances but becomes dangerous when those circumstances change".[36] In this way, groups and organisations develop cultures as they perform together. Stacey refers to these cultures as "company or industry recipes or retained memories" and goes on to assert that "individuals who are part of any group are put under strong

[36] Argyris (1990) refers to this as 'skilled incompetence'.

pressure by the group processes to conform, that is, to share the mental models of the other members". This, argues Stacey (1996: 61) becomes a "serious liability" when conditions are changing rapidly.

Managing far from certainty and agreement must take the form of double-loop or "complex learning" (1996: 64). Here, the consequences of actions lead to the questioning of the mental model and the underlying assumptions that have been driving the actions. As Stacey goes on to state "complex learning requires destruction of old ways of doing things" (1996: 65).

Thus, "in mainstream thinking, knowledge is ultimately located in the mental models, the inner world, of individual minds, consisting of representations formed in past experience and stored in memory". The shift presented is "from a notion of past experience being more or less accurately recorded and placed in storage, to past experience shaping current relating processes in the living present.....knowledge then, is not stored but perpetually created" (Stacey 2001: 97).

Stacey also argues that "knowledge is always a process, and a relational one at that, which cannot simply be located in an individual head, to be extracted and shared as an organisational asset". Moreover, organisational policies that disrupt relational patterns between people, could "seriously damage its knowledge-generating capacity". In other words, "the knowledge assets of an organisation lie in the pattern of relationships between its members and are destroyed when those relational patterns are destroyed" (2001: 98).

These relationship patterns manifest themselves in a number of ways, but it is clear that there exists a link to organisation culture[37]. Thomas and Mullaly (2008) found that the "project management culture within organisations stood separately and distinctly from the organisation culture they existed within" (2008: 355) and had a significant impact on how the practice of project management was viewed and specifically, how the role of the project manager

[37] Here defined as the values, norms and structures of an organisation.

was viewed. This perception took one of two forms: being seen either as a tool for control (with a strong process emphasis) or as a leadership discipline (with an emphasis on coaching and mentoring).

2.5.4 Legitimate Peripheral Participation & Communities of Practice

Lave and Wenger (1991) introduced the concept of Legitimate Peripheral Participation (LPP) as a response to the apparent confusion and lack of clarity surrounding terms such as 'apprenticeship' and 'situated learning'. LPP is proposed "as a descriptor of engagement in social practice that entails learning as an integral constituent" (1991: 35). The authors draw the distinction between "learning as internalisation" and "learning as increasing participation in communities of practice" (1991: 49) and usefully embellish the link between "theorising about social practice and activity" and "the development of human knowing through participation" (1991: 50). Moreover, viewing learning as legitimate peripheral participation means that "learning is not merely a condition for membership, but is itself, an evolving form of membership" (1991: 53).

In this way, identities become seen as long term, living relations between persons and their place and participation in 'communities of practice' – a term first used by Lave and Wenger in 1991. As William F. Hanks puts it in his introduction:

> *Rather than asking what kind of cognitive processes and conceptual structures are involved, they ask what kind of social engagements provide the proper context for learning to take place.*
>
> (Lave and Wenger 1991:14)

Communities of Practice (CoP) are subsequently defined (Wenger, McDermott et al. 2002) as "groups of people who share a concern, a set of problems or a passion about a topic, and who deepen their knowledge and expertise in an area by interacting on an ongoing basis" (2002: 26).

To distinguish between what a CoP is, and what it is not, there are three essential pre-requisite characteristics of a CoP:

1. A shared *domain* of interest with commitment to the domain;
2. A *community* where members of a specific domain interact and engage in shared activities; and
3. A *practice*, with members that are practitioners, who develop a shared repertoire of resources.

Project-based environments – and the MOD is such an environment in the context of this research - share many of the features of Communities of Practice. Bredillet (2008) compares the characteristics of 'project team' with a CoP and makes the assertion that, whilst there are differences between these two, nevertheless "projects as such are learning organisations or learning places" (2008: 243). Indeed, Wenger and colleagues acknowledge that such communities have been pervasive for a long time, and assert that it is not the communities of practice themselves that are new, but the "need for organisations to become more intentional and systematic about managing knowledge" through exploitation of the CoP construct (2002: 6).

Wenger, McDermott and colleagues (2002) go on to propose the following key points[38] about the 'nature of knowing':

- Knowledge is a living process and an integral part of people's actions and interactions;
- Knowledge is tacit as well as explicit, and requires informal learning processes such as conversations and coaching;
- Bodies of Knowledge are developed through a process of communal involvement; and
- Generation, sharing and 'stewarding' of knowledge requires appropriate social structures.

CoP are, according to Wenger et al, central to the challenges associated with such knowledge and learning. A newcomers' legitimate peripherality has significant benefits as paraphrased below (Lave and Wenger 1991: 95).

[38] It is interesting to note that the authors give the example of a move to project-based organisations as an ideal social structure to which managers can assign project responsibility, and yet, by inference, this is not believed to be the appropriate structure for assigning responsibility for knowledge management.

> *It involves participation as a way of learning….being absorbed in a 'culture of practice'…..with opportunities to make the culture of practice theirs…..assembling a general idea of what constitutes the practice…who is involved…what everyday life is like…how masters talk, walk, work and generally conduct their lives…what other learners are doing...what learners must understand to become full practitioners…it offers exemplars.*

Interestingly, apprenticeship learning is supported by conversations and stories about problematic and especially difficult cases (Lave and Wenger, 1991: 108). The distinction is also made between *talking about* and *talking within* a practice. As they observe, the purpose of discourse within practice (especially for newcomers) is not simply to learn *from talk* as a substitute for legitimate peripheral participation, but learning *to talk* as a key to legitimate peripheral participation (1991: 109). In his article, Bond (2009) refers to the CoP concept as being "the perfect vehicle for knowledge transfer and competence development". Coupled with the role of leaders to ensure an organisation's intellectual capital is captured (Julian 2008) the importance and potential of CoP concept and practice within the project management environment is very evident.

2.5.5 Levels of Learning

The above commentary underlines the situated character of learning and introduces the 'co-production' and 'co-development' of knowledge through interaction. According to Berggren and colleagues (2008) socialisation of learning needs to be "operationalised in both individual and collective settings with the organisation" and three learning 'spaces' are proposed (2008: 290)[39]:

(1) *The Individual:* the course delegate, the most important carrier of new knowledge and lessons learned;

(2) *The team or group*[40]*:* by sharing experiences individuals develop new knowledge beyond the reflection of each individual; and

(3) *The company*: turning lessons into organisational and corporate practice development –and vice-versa.

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[39] An alternative phrase, preferred by the researcher, is that of 'levels of learning'.

[40] Whilst the authors group these as being the same, I would argue that here is a difference between 'team' and 'group' – see for example Katzenback and Smith (1993). Team has been adopted for the purposes of this research.

These three come together to create personal learning and behavioural changes as well as organisational learning and changes. Just as new knowledge needs to be diffused within and across the sponsoring organisation, so too can education and training interventions draw upon corporate experience. Bredillet makes a similar point, describing the project environment as one where "learning and practice are integrated" involving knowledge at the level of the individual, team and organisation (2008: 243).

Building on the work of Berggren and Sodurland (2008) the table below has been developed in an attempt to describe these 'modes of learning' in relation to project management education, training, working and learning.

	Individual	**Team**	**Organisation**
Reflection	***Individual reflection:*** *personal articulation of E&T course experience*	***Experience sharing:*** *class discussions / team-based events*	***Organisation dialogue:*** *public presentation, lessons shared and learned, implications understood*
Action	***Individual action:*** *action plans, presentation of measures for personal and project improvement*	***Teamwork:*** *improved joint work-products, better problem solving, improved delivery*	***Organisational action:*** *funded / sponsored improvement projects, visibility of executive commitment & change*

Table 2.1 Modes of Learning in Project Management Education
(adapted from Berggren and Sodurland 2008: 290)

Bredillet (2008) invites us to consider further the "organisation of learning and the necessary supporting structures" in the context of a general environment (tasks, people, stakeholders) that also influences learning and proposes a model (2008: 244) in response to three series of objectives, namely:

1. The objective of *individual* learning – bridging the gap between present and expected level of performance by acquiring PM E&T, qualifications and certifications;
2. The objectives of *team* training – developing team competencies, and
3. The objectives of *organisational* learning – recognising amongst other factors the degree of maturity reached by the organisation.

Bredillet goes on to say that "the design for learning and acting has to provide coherence between the different learning and acting levels" (2008: 246) and should integrate both single loop and double loop learning discussed earlier. Only in this way will "project wisdom in action" result "where practice and education are intimately and inextricably linked" (2008: 248).

2.6 Chapter Two ~ Literature Review: *Summary*

> *"From an industry perspective, it would be useful to be able to say that if an outstanding project manager is responsible for a project, it guarantees success, but this is not always true...(in fact)...the relationship is, at best, tenuous".*
>
> Alam et al (2008: 224)

This review of the literature highlights three fundamental points in respect of approaches to project management education and training and 'fit' with socio-cultural thinking on learning in organisations and the workplace. Firstly, there is a significant body of literature underpinning claims of inadequacies in current approaches to PM E&T in respect of wider competence development. Secondly, the challenges associated with learning in a complex, dynamic, project-centric environment are considerable and require responses that are measured, deliberate and strategic. Finally, there is a real opportunity for leveraging the intellectual, structural and organisational capital of the project environment through the exploitation of new and innovative methods of learning and genuine competence development in the workplace, provided that that workplace is 'fit' for such a purpose.

In the case of the first of these, there is evidence of concerns amongst many academics and thoughtful practitioners that the current – certainly traditional – approach to education and training has been too pre-occupied with 'know what' producing 'trained technicians' than 'know how' and the creation of 'reflective learners". The traditional approach at the level of the individual is believed to be too narrow, too shallow and perhaps too 'skills-centric' to allow the effective transition and application of learning into a wider, organisational context.

That said, there is also evidence that in more 'mature', project-based organisations, delivering commercial projects to paying customers, the traditional approach does have value. This is perhaps as a direct consequence of increasing organisational maturity leading to greater awareness of the nature of 'project management competence' and that this comprises more than a collective of individuals' knowledge and skill – but also involves appropriate motive, traits and self concept. True competence built in a coherent way at the level of the team and the organisation with the necessary characteristics being used to shape recruitment policy and practice. In less mature organisations, or ones more functionally structured and where projects are delivered by and for the same customer / end user, there is evidence that training and educating at the level of the individual does not directly translate into learning in the workplace. The importance of seeing such organisations as 'complex dynamic systems' is key to understanding that 'retained memories' become a 'liability' when conditions are changing rapidly.

In such an unstable and uncertain environment – which it could be argued, is most certainly the case in defence projects – the role played by 'community' and 'peripheral learning' becomes both a threat and an opportunity. A threat because the 'wrong' community, with inappropriate behaviours and attitudes may form and dominate, and an opportunity because without one, a 'clean sheet' becomes the template for its formation. Paramount in either instance is the inter-play between the 'deep learning cycle' and the 'organisational architecture' and coherence across levels of that architecture. Here it has also been seen that a 'technicist' approach and pre-occupation with the 'tangible' – infrastructure, methods, tools – at the expense of the 'intangible' – awareness, attitudes, beliefs – produces the 'wrong' kind of change. There is evidence of the need to add other factors such as the environment in which the project is being executed and the culture of the enterprises involved into the equation in order to establish a more complete and more meaningful understanding of the challenges and issues that need to be faced and resolved. At the same time, there must be the right 'fit' between the implementation of project management in an organisation, the education and training that supports that implementation and the internal and external context of the organisation.

2.7 Research Questions

The overarching research aim, together with the review of the literature conducted and described above, has together resulted in a set of four main Research Questions (RQ) with sub-questions as given below.

RQ1: What are student views on the experience of their PM E&T?

a) *How familiar are students with the Project Management (PM) discipline?*
b) *What prior PM knowledge / experience / qualifications do students have?*
c) *How relevant do students consider PM E&T to be for their careers?*
d) *Which aspects of PM E&T are believed to be the most valuable?*
e) *Did matters covered in PM E&T leave any gaps?*

RQ2: What are the beneficial changes over time as a result of PM E&T?

a) *At the level of the individual? The project? The organisation?*
b) *How relevant is project management to students' military / future careers?*
c) *What have been the specific benefits arising over time from PM E&T?*
d) *What other influences in the workplace contribute to beneficial change?*

RQ3: What are the barriers over time to the realisation of benefits from PM E&T?

a) *To what extent can PM E&T be directly applied in the workplace?*
b) *Are the benefits from PM E&T being realised over time? If not, why not?*
c) *Are taught methods being used in situations where they are not appropriate?*
d) *Is full use being made of the taught subjects? If not, why not?*

RQ4: What can MOD do to improve its return on investment from PM E&T?

a) *What changes could be made to the content of PM E&T?*
b) *Is the focus on the individual alone sufficient or are there other targets?*
c) *Is there the right balance across different elements of competence?*
d) *Should there be more investment by MOD into PM E&T?*

These questions informed the methodology as described in Chapter 3 that now follows.

"To repeat what others have said, requires education; to challenge it requires brains".

Harriet Martineau (1802 - 1876)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This research is aimed at addressing the following questions:

RQ1: What are student views on the experience of their PM E&T?
RQ2: What are the beneficial changes over time as a result of PM E&T?
RQ3: What are the barriers over time to the realisation of benefits from PM E&T?
RQ4: What can MOD do to improve its return on investment from PM E&T?

As such, the study is concerned first and foremost with people and their social contexts – specifically, the experiences of British Army officers (the students) having studied Project Management (PM) and then working in a project based environment. The research therefore constitutes an example of empirical social science research, and the methods selected for the collection of data will be drawn from those associated with social sciences.

Somekh and Lewin (2009) provide a useful overview of the origins of social science research methods referencing, for example, anthropology, sociology and psychology as all contributing to their development in relation to, and sometimes in opposition to, natural sciences. Faced with the historical positivist approach of the natural sciences, the development of social science research led to "elaborate methodological fortresses in which particular understandings of knowledge, truth, values and being give firm foundations for research design and provide defensive bulwarks against external criticism" (2009: 2).

Bassey (1999: 38) provides an alternative starting point for any discussion on research methods by providing a definition of 'research' namely that:

> *Research is systematic, critical and self-critical enquiry which aims to contribute towards the advancement of knowledge and wisdom.*

According to Morrison (2007) two questions are key to any research activity:

1. What is the relation between what we see and understand - our claims to 'know' and our theories of knowledge - and that which is reality?

and

2. How do we go about creating knowledge about the world in which we live?

To answer these questions it is necessary to consider the ontological, epistemological and methodological aspects of any particular research activity.

Easterby-Smith and colleagues refer to *ontology* as "the set of assumptions that we make about reality" (2004: p31) or put another way, the range of perceptions about the nature of reality. In this way, *ontological assumptions* which researchers' make underpin the ways in which they claim to 'know'.

Bryman and Bell (2003) argue that the entity 'reality' can either be considered as an objective or subjective one. These different ways of seeing the world are often called 'paradigms', following Kuhn's work (1970). *Epistemology* - how we come to know - is therefore central to any research study given that researchers "seek to know the reality they are describing" (Morrison 2007: 18).

Positions on both ontology[41] and epistemology[42] underpin research since they directly affect and inform the choice of methodology[43], or methodologies, which are then used in a research study.

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[41] Defined for the purposes of this dissertation as a theory of the nature and essence of things.
[42] Defined here as the philosophy of knowledge or how we come to know.
[43] Defined here as the practical consideration of how we come to know.

In considering research questions, Hussey and Hussey (1997) present a continuum of core ontological assumptions ranging from 'positivist' at one extreme ('reality as a concrete structure') through to 'phenomenological' at the other ('reality as a projection of human imagination') (Hussey and Hussey 1997: 156-159). Bryman and Bell (2003) adopt the terms 'objectivism' and 'constructionism' while Guba and Lincoln (1994) describe what they consider to be the two main research paradigms as being 'positivism' and 'constructivism'. Building on the latter, Table 3.1 contains a summary of the features of constructivism vs. positivism as presented by Collis and Hussey (2003) in order to illustrate the fundamental features of these alternative paradigms.

Constructivism	Positivism
Tends to produce qualitative data	Tends to produce quantitative data
Uses small samples	Uses large samples
Concerned with generating theories	Concerned with hypothesis testing
Data is rich and subjective	Data is highly specific and precise
The location is natural	The location is artificial
Generalises from one setting to another	Generalises from sample to population

Table 3.1: Features of the two main Paradigms ***(adapted from Collis and Hussey, 2003:55)***

Drawing on the words of Trochim (2006) in a deterministic, positivist world, deductive reasoning and science were seen to be the "way to get at the truth". Constructivists, on the other hand, believe "views of the world are based on perceptions of it", and because perception and observation is fallible, such constructions must be imperfect. Errors are reduced when triangulation across sources is used to "get a better feel for what's happening in reality" (2006: 7).

Brannen (2005) states that there are three kinds of rationales that underlie the choice of method: paradigms, pragmatics and politics. In the context of this research, it was apparent from the outset that the nature of the research aim (to explore elements of students' perceptions and the 'reality' of the workplace) as well as practical (time available, access, confidentiality) and even political considerations (both organisational and governmental), a 'mixed methods' approach was believed necessary.

Mixed methods approaches to social inquiry (i.e. both research and evaluation) involve the planned use of two or more different kinds of data gathering and analysis techniques (Greene, Kreider et al. 2009). Mixing methods in this way, working with different types of data, has come to be seen as a "good thing" (Mason 2006: 3) and 'advantageous' (Saunders, Lewis et al. 2003). A stated key benefit of mixed methods research is the use of both numbers and words and "mixed methods research that uses both quantitative and qualitative approaches has the advantage of allowing for both" and "may come into its own at a time when social science research is first and foremost required to be practically relevant and applicable to policy" (Brannen 2005: 6).

For the purposes of this study, neither extreme of the positivist nor the constructivist ontological positions were deemed to be wholly appropriate. This is in line with the thinking of Bredillet (2008) who argues for the need for an "integrative epistemological position" and proposes an alternative epistemological perspective for project management – combining elements of both positivism and constructivism. This "integrative epistemological approach" for project management "calls for better understanding of organisations by treating explicit, tacit, individual and team / organisational knowledge as being distinct forms – inseparable and mutually enabling" (2008: 240).

The research methods employed in this study involved both standardised questionnaires and semi-structured interviews and in the words of Greene et al (2009) represents a "classic instance of mixing data gathering and analysis techniques (2009: 274). Of the six strategies[44] for mixing methods as described by Mason (2006) the one which best 'fits' this study is the so-called 'Integrative Logic' (2006: 6) where the different methods are used because "in combination they give a better sense of the whole". Mason argues that this is "a great deal more challenging to put into practice" especially when "integrative analysis of different kinds of data are attempted" (2006: 7).

[44] The six strategies are: Rhetorical Logic; Parallel Logic; Integrative Logic; Corroborative Logic; Multi-dimensional Logic and No Intrinsic Logic. See Mason, J. (2006). Six strategies for mixing methods and linking data in social science research. Manchester, ESRC National Centre for Research Methods. 4/06.

Broadly speaking, therefore, this study has adopted an interpretive paradigm involving mixed methods and the use of both quantitative and qualitative data collection methods to aid the search for meaning. A number of surveys and a series of interviews were used to generate data aimed at addressing the Research Questions in an 'integrated' way. Further details of these methods are provided below.

3.2 Research Design Considerations

Research design is primarily focussed around the specific activity necessary to prepare, manage, implement, oversee and conduct the research. Easterby-Smith and colleagues (2004) refer to this activity as the 'organisation of research activity'. A number of specific points relevant in the context of developing the research design are described below.

3.2.1 Project Sponsor

The UK MOD is, by its very nature, a highly political organisation and it was felt necessary to secure senior sponsorship of the work as part of the process of establishing and maintaining 'buy-in' from students. Considerable work was undertaken 'up front' to get the military customer 'on-side'. This required early notification of the work that was planned in the form of a project proposal which was 'approved' locally at the Defence Academy before being submitted to Major General Chris Wilson CBE, the military Sponsor of acquisition related courses. Following approval of the proposal in February 2008, permissions were subsequently granted to engage in a formal way and a letter of support explaining the MOD rationale was issued by the Sponsor (See Appendix A).

3.2.2 Selection of Participants

A fundamental enabler of the research was timely access, by the Researcher, to an appropriate course of Project Management Education and Training at the Defence Academy. The data set was therefore 'self selecting' in that it

comprised the students attending two courses[45] referred to here as Cohorts 4a and 4b. The original Defence Academy expectation was for a combined student population of 120, in line with the contractual commitment of Cranfield University to support up to 60 students per course. The students within this data set were selected to complete the course as a result of their job related responsibilities. As such, this 'set' could be considered representative of the British Army officers attending previous, and indeed future, courses.

3.2.3 Details of Data Set

Due to a variety of reasons (not least of which was the operational commitments of the British Army in Iraq and Afghanistan) the final course numbers were smaller than had been expected. Cohort 4a consisted of 55 students and Cohort 4b just 23 students – a total sample of 78 students[46]. All students were male[47] with an age distribution of 30-45 years of age.

Furthermore, within Cohort 4a there was a split of students between those that went directly into post (i.e. started work) immediately after the course and those that went on to complete further technical and specialist studies as part of the Battlespace Technology (BTC) MSc. The data set therefore comprised 4a Non BTC (20 students), 4a BTC (35 students) and 4b Non BTC (23 students).

It is important to note, that although the data set comprised students from two cohorts (i.e. 4a and 4b) entering the workplace at two different points in time (i.e. BTC and non-BTC) there were in fact no other material differences between these groups and their respective course of PM E&T that might otherwise have required their separate treatment and analysis. To that end, therefore, the total student data set was treated as a single 'homogenous' sample and findings are presented and discussed on that basis.

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[45] Data collection took place at different points in time for these two cohorts. However, the courses were identical in duration, content and teaching staff, and for the purposes of this research are regarded as a single course and a single sample.

[46] This original data set of 78 students was subsequently reduced to 75 as a result of 3 students being removed from the data set. Two were posted overseas and the (single) female student left the Army.

[47] The only female student on the course left the Army following completion of TechET and took no further part in the research.

3.2.4 Research Timescale

A key aim of the research was to explore the experiences of students over time where "variation to views and perceptions" was to be measured (Saunders, Lewis et al. 2003: 480). As such, the decision was taken at the outset to conduct a longitudinal study rather than a cross-sectional study. Data collection extended over a 17-month period, from June 2008 (Baseline Survey for Cohort 4a) to November 2009 (final interviews for Cohort 4b). Being longitudinal in nature, and involving students that were serving Army officers with duties and responsibilities that were both demanding and somewhat unpredictable, the research was at risk from both the attrition of survey response rates over time and the practical difficulties associated with accessing individuals for interviews in a timely manner. These and other threats were identified early on and steps were taken to reduce their impacts. A student database[48] including relevant contact details against students' Unique ID Codes was developed and maintained and support enlisted from MOD Central HR[49] to provide alternative and direct access to students. Regular updates and reports were issued to the MOD Sponsor to maintain visibility and buy-in.

3.2.5 Student Work Related Roles

Students ultimately went on to fulfil a range of project related roles[50] within various parts of the MOD. The range of roles occupied is shown in Table 3.2:

Role Type	% in Role Type
DEC Staff	13.5
IPT Project Staff	10.8
IPT ILS Staff	5.4
Requirements Manager	18.9
FLC	10.8
R&D	8.1
Other[51]	32.4
Total	**100%**

Table 3.2 Type of job related role in student data set

[48] Ethical considerations associated with this database are covered later.
[49] The MOD HR function is based in Glasgow where details of all Army staff locations are maintained. With text provided to them, 'Glasgow' issued emails directly students in addition to the emails issued from the researcher's own database.
[50] DEC: Director of Equipment Capability (the 'Sponsor'); IPT: Integrated Project Team; ILS: Integrated Logistics Specialist; FLC: Front Line Command (the 'User'); R&D: Research & Development.
[51] The 'Other' roles category was made up of a wide range of job titles which students chose to report on as separate roles rather than as one of the categories provided. Consequently, 'Others' constitutes a large category in its own right. However, these roles are all acquisition related and required PM E&T.

Whilst all roles include project related responsibilities, the direct relevance of PM E&T to each of these roles does vary. For example, IPT Project Staff are more directly involved in project management type activities than IPT ILS staff. Again, whilst both DEC and FLC staff are involved in project activity, they do so from different perspectives, namely Sponsor and User respectively. Here again, no explicit attempt has been made to segment data across these various role types although the research does comment as and when possible, on findings that suggest possible trends or differences as a result of role type.

3.3 Data Collection Methods

The aim when designing research is to select the best possible data collection mode[52] to suit the particular requirements of the research questions while maximising the quality of data collected (de Leeuw 1992; Roberts 2007). The sections below describe the data collection methods – survey and interviews – used by the research[53].

3.3.1 Survey

The Research Questions[54] (RQs) were informed by the Literature Review (see Section 2.7). The RQs themselves were then used "to point to the data that was needed" since "a well asked question indicates what data will be needed to answer it" (Punch 1998: 38). In this way, the structure of each survey (Baseline, Initial Review, Final Review) was built up of a number of sections along the lines of the following:

- Static 'one off' items (age, gender, role etc.)
- 'Maintenance' items (contact details, Unique ID, surveys responded etc.)
- RQ related items (changes, benefits, barriers etc.)
- 'Continuity' items (request for interview, keeping in touch etc.)

[52] 'Mode' here is taken to mean 'method' but is adopted in keeping with Roberts, C (2007).
[53] The work of Thomas and Mullaly (2008: 41 - 77) investigating the value of project management provided some useful ideas for the types and categories of questions for both surveys and interviews.
[54] The distinction between a Research Question and a data collection question is important where the latter is used to provide data relevant to the former (Punch 1998: 39).

In this way, a clear linkage between elements of the literature, the RQs and the survey items was established and maintained across the various survey releases. Consideration was given to the use of 'open' vs. 'closed' questions, the order of questions (e.g. sensitive questions were not placed at the beginning, topics were not mixed) and their precise wording (e.g. short and simple, jargon free, no double-barrelled and no double negative). A range of format was employed (rating scales, ranking scales) and additional clarification was provided in 'pop-up' windows as and when required. Each survey typically comprised around 25 questions.

An early decision taken was to make use of an on-line survey facility[55] rather than rely on potentially cumbersome and rather more time consuming hard copy methods[56]. All surveys were designed, tested and piloted (with IT, academic and military staff) before formal launch via a hyperlink embedded in a covering email to each student on an individual basis[57]. The specific questions contained in each survey were defined and confirmed through the use of a Research Question (RQ) Matrix (see Section 3.3.3 and Table 3.5). This Matrix ensured that all elements of the RQs were addressed at the appropriate point(s) in time. The research was interested in trends over time and it was important to ensure that responses received would allow such analysis.

Attitudinal data was gathered in line with RQs using a Likert scale of 1 – 4 (e.g. 'Very Useful', 'Useful', 'Of Little Use', 'Of No Use'). In some instances, nominal specific response categories were used to glean additional data e.g. 'Extremely Useful, Very Useful, Fairly Useful, Not Useful and Not Interested', 'Not Useful but Still Interested' or where the range of possibilities required it (e.g. 'Very Easy' to 'Practically Impossible'). Other narrative data was collected using open questions and 'free form' text boxes (e.g. 'How would you summarise your experiences to date?') and students were encouraged to contribute comments with guidance on the purpose of such information provided in the form of 'Additional Information' 'pop-up' boxes in the survey.

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[55] See www.survey.bris.ac.uk for details. A 4-year licence was purchased for the research.
[56] The on-line method also facilitated data export to Excel and SPSS for subsequent analysis.
[57] All emails were sent on an individual basis to ensure a 'personal touch' and assure confidentiality.

Each survey made clear, in a cover page, the objectives of the research and the key, overarching questions that any particular survey was looking to address. Issues of data protection, confidentiality and anonymity were also addressed early on and before the survey questions started in earnest (See also Section 3.6.4 for further commentary of ethical considerations).

Student views on delicate matters (behaviours, barriers etc.) were being sought and it was therefore important to be able to provide students with the reassurance they needed around confidentiality and anonymity. The use of a 'Unique Identifier' was introduced for this very reason, but proved to be a flawed mechanism, as explained later (Section 3.4.1). Data collection difficulties were also experienced in communicating with students over time and maintaining satisfactory response rates. Despite steps taken to minimise this threat, both % response rates and absolute numbers of responses reduced significantly over time as the following table shows:

Data Set	Total Responses Received	Response Rate[58]
Baseline	51	65%
Initial Review	37	49%
Final Review	27	36%

Table 3.3 Survey Response Rates

Issues of sample attrition are well known (see for example Briggs and Coleman 2007: 127). Steps taken by this research to minimise this threat involved the early introduction of the research aim and objectives during the course itself, use of alternative communication channels (researcher's own and MOD direct), issuance of multiple reminders, allowing generous return deadlines, telephone 'chasers' and so on. The consequences of these falling rates for data analysis are explained in Section 3.4.1 below[59].

An example of the on-line survey used is included at Appendix C and a complete list of surveys conducted at Appendix D.

[58] Expressed as a % of the total relevant data set population (i.e. 78 students at Baseline reducing to 75 students for both the Initial and Final Reviews).
[59] A further survey issued after 18 months in connection with a separate, though related research project, achieved a response rate of just 19% (i.e. 14 responses).

3.3.2 Interviews

Whilst quantitative data collection was seen as vital in identifying the 'what' of the research, interviews from the outset were expected to begin to address the 'why' as a means of making possible "new articulation of experience" (Schostak, 2006: 16). Saunders, Lewis et al (2003) describe the qualitative perspective as "non-numerical data or data that has not been quantified" (2003: 486) while Maylor and Blackmon (2005) provide further clarification of qualitative techniques as "data gathering built on the skills that we already possess: reading, asking questions, talking to people and observing what is going on around us" (2005: 67).

An invitation to participate in interviews was included as a question towards the end of each of the surveys. Face-to-face interviews were subsequently arranged and conducted on a purely voluntary and opportunistic basis. A target of 5 interviews per time point (Baseline, Initial Review, Final Review) was achieved, despite the lack of a mandate to engage, and involving as it did, people with very difficult and time-pressured jobs. The following table summarises the overall number of interviews conducted:

Data Set	No. of Interviews
Baseline	10
Initial Review	5
Final Review	6

Table 3.4 Number of interviews conducted

The end-to-end interview process involved a total of 16 individual students (i.e. circa 20% of the total population). Of these, 5 students were interviewed as part of two separate (though not necessarily consecutive) reviews, and one student at all three time points.

Being random and opportunistic in nature, and 'fraught' with practical difficulties in maintaining active involvement of the precise same group of students over an extended period of time, no attempt was made to maintain the involvement of the same students throughout the duration of the research – this would have been, practically speaking, impossible.

As part of the interview 'scene setting', students were reminded of the purpose of the interview and the fact that interviews were to be recorded. Students were invited to sign a form granting consent before each interview.

A set of approximately 10 questions was prepared for each set of interviews (Baseline, Initial Review, Final Review). These questions were aligned to the RQs (consistent with the RQ Matrix, Table 3.5) to ensure appropriate coverage of the RQs at any particular point in time. A pro-forma sheet was used to capture key points by the researcher in 'real time'. In addition, interviews were recorded and audio files transcribed[60] into MSWord. Interviews typically lasted 50-60 minutes and were held at a location convenient for the student – some at the Defence Academy, but most at various MOD locations including Abbey Wood (Bristol), Main Building (London) and Army HQ (Bath, Wilton).

An example of the interview consent form is at Appendix E, Interview pro forma are at Appendix F and the complete research project schedule showing survey release dates and interview activities is included at Appendix G.

3.3.3 Research Question Matrix

In order to ensure complete coverage of the Research Questions (RQs) by both survey(s) and interview(s), a Data Collection Matrix was drawn up as presented in Table 3.5. Here it can be seen that whilst quantitative data was collected across all RQs, qualitative data collection was substantially focussed on RQ2 and RQ3: benefits and barriers[61].

Moreover, one objective of the research, being longitudinal in nature, was to develop trends over time. The same RQ is therefore covered by a number of different questions at these different points in time: Baseline, 6-month and 12-month. In this way, the data collected allowed for 'initial' and 'mature' views to be gathered in respect of the various RQs.

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[60] Technical problems with the recording device were discovered after some interviews had completed. Quick checks of recordings were made after each interview, but not full length checks.

[61] Not all RQs featured, nor were addressed, by each and every data collection intervention. Hence, there are a number of columns with the marker '-'.

Table 3.5: Project Management in the British Army: *Matrix of Research Questions and Data Collection*

Research Question	Baseline		6-Month		12-Month	
	Survey	Interview	Survey	Interview	Survey	Interview
RQ1. What are student views on the experience of their PM E&T?						
a) How familiar are students with the Project Management (PM) discipline?	*Q9*	-	-	-	-	-
b) What prior PM knowledge / experience / qualifications do students have?	*Q10*	-	-	-	-	-
c) How relevant do students consider PM E&T to be for their careers?	*Q11, 12*	*Q1, 2*	*Q8, 9*	*Q1, 2*	*Q7,11*	-
d) Which aspects of PM E&T are believed to be the most valuable?	*Q13*	-	*Q12, 13*	-	*Q12*	*Q6*
e) Did matters covered in PM E&T leave any gaps?	*Q19*	-	*Q21*	-	-	-
RQ2. What are the beneficial changes over time as a result of PM E&T?						
a) At the level of the individual? The project? The organisation?	*Q15*	*Q6*	*Q20*	*Q6*	*Q10,19,20*	*Q1*
b) How relevant is PM to students' military / future careers?	*Q11, 21*	*Q3*	*Q8,9,10*	*Q3*	*Q8,22*	-
c) What have been the specific benefits arising over time from PM E&T?	*Q15,17,18*	*Q4*	*Q18,19*	*Q4*	*Q18,21*	*Q5*
d) What other influences in the workplace contribute to beneficial change?	*Q16*	-	*Q17*	*Q4*	*Q16*	*Q4*
RQ3. What are the barriers over time to the realisation of benefits from PM E&T?						
a) To what extent can PM E&T be directly applied in the workplace?	-	-	*Q20,15*	*Q6*	*Q17,15*	*Q3*
b) Are the benefits from PM E&T being realised over time? If not, why not?	-	*Q5*	*Q20,16*	*Q8, 5*	*Q13,14,21*	*Q9,2*
c) Are taught methods being used in situations where they are not appropriate?	-	*Q7*	*Q24*	*Q7*	*Q24*	-
d) Is full use made of the taught subjects? If not, why not?	-	*Q8*	*Q14*	*Q8*	*Q13*	*Q10*
RQ4. What can MOD do to improve its return on investment from PM E&T?						
a) What changes could be made to the content of PM E&T?	*Q13, 19*	*Q1*	*Q14*	*Q3*	*Q21*	
b) Is the focus on the individual alone sufficient or are there other targets?	-	*Q5*	*Q16*	*Q6*	*Q10*	*Q4*
c) Is there the right balance across different elements of competence?	-	*Q8*	*Q20*		*Q21*	*Q6*
d) Should there be more investment by MOD into PM E&T?	*Q22*		*Q11, 25*		*Q7, 9*	*Q9*

Key: *Q(x)* – element covered by Question (x) in respective survey(s) and interview(s).

3.4 Methods of Analysis

3.4.1 Quantitative

With an original total target population believed to be of the order of 120 students (two cohorts of 60 students each), the original approach to quantitative analysis was expected to be substantially statistical in nature involving the extensive use of SPSS. In practice, the total number of students from both cohorts amounted to 78 students, which represented the 'Baseline' data set. Moreover, despite a number of steps being taken to minimise attrition of this data set, leading to a commensurate reduction in the number of survey responses, rates reduced over time from 65% (51 responses) at the time of the Baseline survey to 36% (27 responses) after 12 months. This resulted in the need to re-think the approach to quantitative analysis.

The net effect of this was twofold. Firstly, the smaller sample sizes reduced the opportunity to justify, or indeed support, rigorous and robust statistical analysis. Secondly, the difficulties associated with individual comparison led to 'whole group' comparisons and an overall more descriptive use of quantitative data.

It would have been beneficial to have linked individual student responses over time and indeed, the survey design allowed for this through the introduction of a student unique ID[62]. However, this strategy was not successful and tracking individual student responses thereafter proved practically impossible for a variety of reasons. Firstly, it would have required access to students' personal details, which as has been said, was not an option. Secondly, it would have potentially compromised student anonymity which, given the nature of the data being collected, was a key consideration. Finally, it would have required a more sophisticated (i.e. expensive) tool for preparing, handling and analysing survey responses which was not available. Research Findings (Chapter 4) are therefore presented on a 'whole group' basis and the limitations of this approach are outlined in Conclusions (Chapter 6).

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[62] The initial intent was to 'track' student views and experiences over time. For reasons of confidentiality and anonymity this involved students creating and using their own unique ID. Unfortunately, however, this strategy was not successful. As a result it proved practically impossible to track individual student responses over time from Baseline, through Initial Review and on to Final Review.

Working with, and comparing 'whole group' data from one time point to another introduced a further consideration - the make up of the so-called 'whole group'. In comparing the 'whole group' over time (acknowledging that the population of this group is a diminishing number) it was important to ensure that this was in effect the 'same' whole group being compared. Without such reassurance, it would have been possible for the variable nature of the 'whole' groups' data set to have affected the analysis. It was important, therefore, to understand (and confirm) whether or not it was the same 'whole' group, or a different group responding on each occasion.

Each subsequent survey invited students to confirm that they had responded to the previous survey. This data has allowed the preparation of Table 3.6 which shows that there was a high 'repeat rate' for each of the surveys and that (with the exception of the Initial Review for Cohort 4a Non-BTC students) it was the same (albeit a progressively fewer number of the same) students that responded to each of the surveys[63].

Survey	Total No. of Students	Responses Received	No. of (%) responding to Baseline	No. of (%) responding Baseline & 1st Review
Baseline	78	51		
Initial Review	75	37	34 (92%)	
Final Review	75	27	27 (100%)	27 (100%)

Table 3.6 Survey responses over time

In practical terms, once the survey cut-off date had passed, survey responses were exported from BOS into Excel as 'coded' data. Survey codes were also exported into a separate file to act as a reference for the coding used. This master file provided a basis for the design of separate spreadsheets for 'quantitative' data and 'narrative' data.

[63] This table shows three time points (Baseline, Initial Review and Final Review). However, due to the 'split-cohort' nature of the data set (i.e. BTC and Non-BTC) there were in fact five separate surveys over the 15-month period. The management and maintenance of this data set was a significant challenge in its own right and has provided the basis for a number of lessons learned in respect of conducting longitudinal studies, reported on in Chapter 6 and Appendix H.

Quantitative data was subsequently exported in SPSS for further analysis whilst qualitative data was printed and used as hard copy to inform thematic analysis along side interview outputs.

3.4.2 Qualitative

Data collected was intended to be stored, sorted, sifted, categorised and coded for use in constructing descriptive and explanatory accounts to be presented under each of the Research Question headings. In this way, it was expected that qualitative research findings would allow the identification and description of key themes along the lines of 'thematic synthesis' as described by Thomas and Harden (2007). At the outset, therefore, an intentional and iterative interplay was expected and planned between the separate analyses of quantitative (descriptive statistics) and qualitative (key theme) data sets.

Thomas and Harden describe this as being a 3-stage process:

1. The free line-by-line coding of the findings;
2. The organisation of these 'free codes' into related areas to construct 'descriptive' themes; and
3. The development of analytical themes.

This was broadly speaking the process adopted by this study. Interview scripts, and the summary notes prepared at the time of the interview, were read and comments coded in respect of key RQ headings such as 'personal changes', 'benefits' and 'barriers'.

Up to this point, the synthesis was very close to the original RQs, the descriptive themes developed being very much 'data driven'. The next step, described by Thomas and Harden (2007) as the "most controversial" relies, at least in part, on the judgement of the reviewer in articulating "theory-driven" analytical themes based on judgement and inference in connection with what had been said or expressed (2007: 10).

In respect of this study, the probability of risks associated with inappropriate researcher inference and inaccurate judgement (i.e. that the researched basically got it wrong) was low since many of the statements made by students included specific words or phrases that reduced the need for inference or interpretation *per se*. The reliance on verbatim quotes – used extensively in the presentation of findings in Chapter 4 - also goes some way to further reduce the risk of misinterpretation since the final judgement on meaning is left to the reader, rather than being provided by the researcher.

In practice, the process of data analysis conducted for this study was onerous and at times laborious given that a large amount of different kinds of data was generated. The work was also rather 'messy'. For example, whilst the process of describing themes was in principle well defined, the work involved in analysing the data associated with those themes was rather less structured than had originally been envisaged or described in methodological references. Interestingly enough, this was also the experience of Greene et al (2009) who described their experience of integrating mixed methods analysis as a work process that was "fluid and intuitive....pitting objective reality and contextual nuance, numbers and words against one another" (2009: 279).

3.5 Limitations of the Research Method

3.5.1 Introduction

It is self evident that the planning, execution, analysis and conclusions drawn from any form of research should be reliable and valid. Moreover, the results must be credible and the extent to which they are replicatable and generalisable needs to be understood, and clearly stated. This study is of course no exception to such universal rules. However, Brannen (2005) drawing upon the work of Spencer and colleagues (2003) in connection with mixed methods research states (2005: 25) that:

> *universal agreement seems to have been reached that quality concepts developed for quantitative research such as generalisability, validity, reliability and replicability cannot nor ought not to be applied to qualitative research.*

Thomas and Harden (2007) take the view, for example, that "the quality of qualitative research should be assessed to avoid drawing unreliable conclusions" (2007: 6) and assessed the 'quality' of their own (qualitative) studies with regards "to the degree to which they represented the views of their participants" (2007: 12). Similarly, but in the context of mixed methods research and drawing upon the work of Lincoln and Guba (1985, 1994), Brannan (2005) proposes broadly equivalent concepts such as 'credibility' (cf. internal validity), 'fittingness' (cf. external validity) and 'auditability' (cf. reliability). In conducting mixed methods research, Brannan asks "how far do we work with these separate criteria or do we develop new specific criteria?" (2005: 25).

This study does not intend to answer that question. Rather, and as Brannan suggests, each of the possible quality criteria is considered in the context of its contribution to the mixed methods used. What is certain is that given the relatively small sample size compared with the entire MOD organisation, the nature of the peoples' work under investigation and the complexity of the organisational environment within which project people work, the limitations of this research must be clearly stated and understood.

3.5.2 Research Reliability

Data quality, and therefore research reliability, can be affected by a range of different sources of error and / or bias and consist of both random and systematic errors, including sampling errors (which arise because analysis is based on a sample rather than the full population). According to Roberts (2007) there are three main types of 'mode effect' pertaining to survey methods:

(a) *Coverage error* - when not all members of a target population have an equal chance of being selected;
(b) *Non-response error* – resulting from differential response rates across different subgroups of the population; and
(c) *Measurement error* – actual bias in the responses recorded / reported by either the respondent or the interviewer / researcher.

The relevance of these errors in the context of this thesis are described below.

3.5.2.1 Coverage Error

The opportunity to contribute to the research was open to all, and every student received each survey and could, if they so wished offer themselves up as a subject for interview. As such, coverage errors in this study are not believed to be significant.

3.5.2.2 Non-response Error

Web-based surveys have been found to favour better educated, more literate members of the population (Roberts 2007: 8) and the likelihood of survey participation is intrinsically linked to the survey topic and the level of interest in the topic among members of the target population (Groves, Singer et al. 2000). The target population for this study comprised a number of different subgroups, reflected not only in the range of roles they performed (some being more directly relevant to project work than others) but also in the regiment to which students' belonged. The net effect of these different subgroups is a potential non-response error from those less 'bought in' to the study (perception of the research value e.g. non technical regiments) and less affected (perception of the research relevance e.g. non-project team staff). This may well result in a response bias towards those more inclined to favour and / or support both the research process and its subject matter. The effect of this potential bias in responses to on-line surveys may subsequently lead to bias in interview data, given that interviewees were drawn from those volunteering via the on-line survey. As a result, non-response errors are a distinct possibility in the context of this study.

3.5.2.3 Measurement Error

Such errors can be attributed to two main sources: the 'questions' and the 'actors' involved in the process (Groves 1979). 'Actors' in turn include the respondents / interviewees and the researcher / interviewer. The risk of this type of error in this study is particularly high given the background and personal involvement of the researcher in both developing the course content and teaching it, and given his own personal views on some of the issues associated with project management.

Moreover, the study relies heavily on students' perceptions, rather than measured 'absolutes'. According to Neisser's perceptual cycle (see Butler and McManus, 1998: 24) "the schemas that get built up are not only based on perception but also on the anticipatory schemas that preceded the observed phenomena". As a result, perceptions reported in this study may not be totally reliable especially given the fact that the students here are serving Army officers with attitudes likely to be shaped by a military mind rather than a business mind.

3.5.3 Research Validity

Maylor and Blackmon (2005) define validity as "the extent to which the underlying truth of a situation has been captured and is free from particular influences" (2005: 363). Bryman and Bell (2003) identified three specific attributes of validity, namely causality, generalisation and replication. These are considered, again in the context of this dissertation, below.

3.5.3.1 Causality

This relates to the extent to which there is confidence in the underlying research conclusions, and that there is a justified link between the data collected and the arguments presented. Put another way, and using the words of Brannen, the research is 'credible' and 'fitting'. Clearly, the size of the sample used in this dissertation and issues associated with deteriorating response rates have a direct bearing on challenges to causality of the research findings.

3.5.3.2 Generalisability

This relates to the relevance of the research to, and its application and extension in, domains other than the one of immediate relevance to the research. Whilst the data set comprised students that went on to work in various parts of the MOD, claims of generalisability across the MOD would be unfounded. Moreover, the research uses students from one particular PM E&T intervention as the data set, and there again, its findings may not be applicable in the context of other courses.

Care must therefore be taken not to overstate the findings of the research whilst not undermining its intrinsic value.

3.5.3.3 Replicatability

This attribute relates to the repeatability of the research within other domains, that is to say, the potential to conduct similar research in other disciplines but with limited adaptation. It remains a question for discussion, but on the face of it the notion of 'benefits' and 'barriers' in the context of trained professionals transitioning into a workplace seems reasonable. The same research approach, could, for example be applied to teachers as they move from PGCert studies to positions in schools. However, whilst the process may be replicatable, the findings pertaining to this study (Army officers moving to MOD project related roles) are clearly more likely to be situation specific.

3.5.4 Research Limitations: Summary

The use of mixed methods introduces on the one hand, a number of opportunities to enhance the validity and reliability of the research, whilst on the other results in a situation where the limitations of both approaches are seen to be relevant. Adopting the stance of Brannen, the quality criteria adopted reflect the use and respective contribution of both quantitative and qualitative methods. Whilst neither method is considered "dominant" it is clear that an approach which was expected to be principally quantitative in nature proved to be less so, with the contribution of qualitative data being greater than had originally been envisaged. The limitations of the research, in the light of this outcome, are believed to be adequately described to avoid mis-representation and mis-use of the findings.

The longitudinal nature of the research provides some additional strengths. Somekh and Lewin (2005) see this approach as a way to "more easily establish causality but is expensive to conduct" (2005: 217). Briggs and Coleman (2007) describe longitudinal designs as "more complex" involving "opportunities for answering particular kinds of research questions" but again acknowledge the expense involved (2007: 127). The longitudinal approach is also seen by ESRC as an effective response to the limitations posed by "standard cross-sectional designs" (Sturgis et al, 2007). These advantages of the longitudinal approach are discussed further in Chapter 6, Section 6.3.

3.6 Research Ethics

3.6.1 Introduction

Cavan (1977: 810) provides the following definition of ethics:

> *Ethics is a matter of principled sensitivity to the rights of others. Being ethical limits the choices we can make in pursuit of truth. Ethics say that while truth is good, respect for human dignity is better, even if, in the extreme case, the respect of human nature leaves one ignorant of human nature.*

It is imperative that research is conducted in a way that is entirely consistent with ethical considerations, a respect for individuals and communities and in a way that maintains the integrity of research at each and every level. The following sections outline the guidance and standards associated with research ethics and describe the specific steps taken in the context of this study to maintain complete alignment to, and conformance with this ethical framework.

3.6.2 International and National Standards

The American Educational Research Association (AERA) and the British Educational Research Association (BERA 2004) derivative, make clear that all educational research should be conducted with a respect for:

- The Person;
- Knowledge;
- Democratic Values;
- The Quality of Educational Research, and
- Academic Freedom.

BERA maintain that there are ethical responsibilities associated with participants of research, the sponsors of research and the general community of educational researchers.

3.6.3 GSoE Ethical Framework

The Graduate School of Education (GSoE) Ethical Framework draws on the AERA (1992) and BERA (2004) guidance and advocates that there are three main ethics procedures that GSoE research should follow:

- GSoE ethics procedures
- Faculty of Social Sciences and Law ethics procedures, and
- University ethics procedures[64].

3.6.3.1 GSoE Ethics Procedures

These include due consideration, by both researcher and supervisor, of ethical matters within the study and as evidenced in the completion and submission of a research ethics form.

3.6.3.2 Faculty Procedures

These apply specifically to ESRC funded proposals and to that end, do not apply to this study.

3.6.3.3 University Ethics Procedures

These include Data Protection, Freedom of Information and Equality and Diversity policies. Due consideration of these various policies was made as and when appropriate.

3.6.4 Ethical Considerations

3.6.4.1 Voluntary informed consent

Students agreed to participate without any duress prior to the research getting underway. Students were made aware of the research process, the nature of their participation, how it will be used and how and to whom it will be reported. All students signed a consent form (see Appendix E) as part of the interview process. A statement in each survey made clear that in responding to the survey, informed consent to participation in the research would be assumed.

3.6.4.2 Right to withdraw

It was made clear to students that they had the right to withdraw from the research for any (or no) reason and at any time and they were reminded of this right by a clear statement in each survey and at the time of each interview.

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[64] See http://www.bristol.ac.uk/education/research/networks/ethicnet/procedures/ for complete details.

3.6.4.3 Privacy

Confidentiality and anonymous treatment of data was maintained throughout the research. Not having access to a Unique ID (for surveys) and use of non-attributable quotes (interviews) ensured that all data was treated, managed and reported on in a way that safeguarded the privacy of students. One consequence of this was not being able to match survey responses over three time points.

3.6.4.4 Honesty

Results presented are genuine and direct outputs of the research, free from distortion, fabrication and distortion, being neither secretive nor selective. Issues associated with the research process itself, or the application of research methods have been honestly reported.

3.6.4.4 Sensitivity

Work was done in a way that demonstrated sensitivity to local, established institutional policies and practices as well as ongoing work related activities (e.g. arranging of interviews, communications with students and sponsors etc.).

3.6.4.5 Communication

Steps were taken to ensure adequate and appropriate communication with students, sponsors and the research supervisor aimed at avoiding surprises and ensuring mutual understanding of status and any related issues. Reports produced (including this dissertation) were produced as far as possible using clear, straightforward and appropriate language to relevant research populations, institutional representatives and other stakeholders.

3.7 Chapter Three ~ Methodology: *Summary*

The research aim, objectives and associated questions are seeking to explore elements of not only students' 'perception' about their learning and the application of that learning, but also the 'reality' of their workplace. To that end, neither extreme of the positivist nor the constructivist ontological positions were deemed to be wholly appropriate.

Broadly speaking, therefore, an interpretive paradigm has been adopted involving a mixed methodological approach and the use of both quantitative and qualitative data collection methods to aid the search for meaning.

Moreover, a longitudinal approach was adopted specifically to measure variations to views and perceptions over time as a result of the change from individuals being students of PM E&T to taking on roles as practitioners in the workplace.

Finally, the limitations of the research have been clearly identified and consequences for validity and reliability acknowledged. Ethical considerations have also been addressed. Chapter 6 provides further commentary on the strengths and limitations of the research.

The next chapter, Chapter 4, presents the research findings arising from the use of the methods described above.

"Statistics: The only science that enables experts using the same figures to draw different conclusions".

Evan Esar (1899 - 1995)

"He that hath knowledge spareth his words".

Proverbs 17, vs 27

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Introduction

The review of the literature presented in Chapter 2 highlighted three fundamental points in respect of approaches to Project Management Education and Training (PM E&T) and 'fit' with socio-cultural thinking on learning in organisations and the workplace. These were:

1. There is a significant body of literature underpinning claims of inadequacies in current approaches to PM E&T in respect of wider competence development;
2. The challenges associated with learning in complex, dynamic, project-centric environment are considerable and require responses that are both deliberate and strategic; and
3. There is a real opportunity for leveraging the intellectual, structural and organisational capital of the project environment through the exploitation of new and innovative methods of learning and genuine competence development in the workplace.

The literature review highlighted concerns that some authors have with regards to the current approaches to PM E&T, arguing that there is too great an emphasis on 'know what' and too little on 'know how'. Traditional approaches have been described as being 'too narrow' producing 'trained technicians' rather than 'reflective learners'.

A picture is beginning to emerge that the characteristics of complex projects are such that whilst courses and qualifications in PM have their place in building knowledge and understanding, the response needed to equip project people with the means to deal with the challenges that they face has to involve a wider front of development initiatives aimed at a deeper level of learning and containing a greater degree of organisational and workplace context.

This Chapter sets out to present the totality of findings from the research methods employed (described in Chapter 3) as a basis for discussion in Chapter 5. The findings presented, reflecting as they do student views of their PM E&T and experience of the workplace, are of obvious interest against the aforementioned back-drop of concerns and criticism of traditional class-room based learning. Findings are presented under headings that reflect the main and subsidiary Research Questions (RQ) as summarised in Section 2.7 and depicted in Table 3.5.

The research findings are presented using a combination of descriptive statistics from surveys and the thematic analysis of qualitative interviews. Where descriptive statistics are used, figures and tables make clear the relevant survey and / or student population involved. The anonymous quotes employed to make or illustrate a particular point are *shown in italics* having been lifted directly from either an interview transcript or from comments made in a particular survey response[65]. In presenting the findings in this way, no attempt is made to distinguish between these two sources of qualitative data. Brief reference to the literature and previous research findings will be made as and when appropriate, either to support the findings of this research or to provide a contrasting perspective. More detailed commentary on these links, and their significance or otherwise, is then presented in Chapter 5, Discussion.

A summary of the research findings is presented in section 4.3 including a list of the 26 key Research Findings (RF) for ease of reference in later chapters.

[65] Please note that the findings of the qualitative data focussed on RQ2 (Benefits) and RQ4 ('Barriers') with no coverage of RQ1 ('student views on the experience of their PM E&T').

4.2 The Research Questions

RQ1: What are student views on the experience of their PM E&T?

RQ1a: How familiar are students with the Project Management discipline?

There was found to be a low level of familiarity with both the PM discipline itself and what the term 'project management' actually means. Only 2% of students were 'very familiar' with the PM discipline and what it means. 10% of students were either 'unfamiliar with the term and its meaning' or 'totally unaware of the subject'. Almost half, 49%, were 'familiar with the term but unclear on its meaning', whilst 38% claimed to be 'fairly familiar with the discipline and what it means'.

RQ1b: What prior PM knowledge / experience / qualifications do students have?

The results to RQ1a (indicating the students' generally low level of familiarity with the PM discipline and its meaning) were borne out when questioned about their previous PM knowledge and experience. More than half - 55% - of students reported no previous PM E&T whatsoever. 14% claimed some knowledge from introductory studies (e.g. as part of a first degree) and a further 31% reported some other form of PM E&T from either ICSC(L)[66] and / or their military / regimental training[67]. With respect to familiarity and prior PM knowledge and experience, therefore, it can be concluded that students embarked on the course with a low level of familiarity with the PM discipline and what it entails, limited knowledge and little previous PM experience. Those students with higher levels of knowledge and familiarity were predominantly from engineering related regiments, specifically RE and REME.

RQ1c: How relevant do students consider PM E&T to be for their careers?

At the time of the Baseline, only a narrow majority - 53% - believed PM E&T was 'very' or 'extremely' relevant to their military careers whilst 43% saw it as being 'fairly relevant'. However, this rather high level of disregard for E&T was reversed following students' course experience. At the end of PM E&T, students

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[66] Initial Command and Staff Course (land) – a 32 week course which all newly promoted majors attend at the Defence Academy. This includes a very small amount of PM E&T on topics such as Risk Management and Life cycle.

[67] The two regiments specifically mentioned in survey responses were Royal Engineers (RE) and Royal Electrical and Mechanical Engineers (REME).

were convinced of its relevance with an overwhelming majority - 92% - of students reported PM E&T to be 'extremely' or 'very' relevant to their immediate career (i.e. next posting). This compares with a figure of 84% for relevance to their 'medium term' career and a similar figure – 82% - for relevance to their 'longer term' career. Put another way, PM E&T was considered to be almost as relevant to students' longer term career as it was for the medium term, and only of slightly less relevance than to their next posting.

In addition to 'relevance', the usefulness of PM E&T was also explored at the time of the Baseline[68]. Here, 84% of students reported PM E&T to be 'very useful' or 'useful' to their immediate military career. After 6 months in the workplace, a significant majority – 81% - still considered the learning to have been 'useful' or 'very useful' to their immediate military career. This represents a slight reduction from the baseline figure of 84% and perhaps suggests that for some students, there was a poorer fit than had originally been expected between the PM E&T content and the actual demands of the workplace. The 'fit' of PM E&T to the workplace is certainly a factor in shaping students' perception of the usefulness of the course[69]. However, even in cases where there was arguably a poor 'fit', there is still evidence of utility, as reported by this student:

> *I very much work on my own (no project team) and spend most of my time on the soft PM skills (communication, liaison etc) side. My TechET training has been useful in providing a baseline knowledge to PM and giving me a confidence to deal with industry (and understanding how PM and Defence Acquisition works). Was the course key to me? No, but I am far more efficient with the knowledge it gave and I was able to add value far quicker than had I not done it.*
>
> Army Major 22

In addition to students' own individual and personal career interests, student *perceptions* of the usefulness of PM E&T to the various organisations that they could find themselves working for in the future - next team, MOD in general and employers beyond the MOD – were of interest. Also explored was the *reality* over time of the utility of PM E&T to students' teams.

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[68] At the time of the Baseline survey, both 'relevance' and 'utility' were measured. This was later considered to be unnecessary. Consequently, reference to 'relevance' was discontinued after the Baseline survey and the Initial and Final Reviews considered only 'usefulness'.

[69] The 'fit' of the course to certain postings is a theme we shall return to later (see RQ1e) in the context of gaps in the course curriculum.

At the time of the Baseline, some 86% of students perceived that PM E&T would be 'useful' or 'very useful' for both their next team and for the MOD in general. A greater proportion - 92% - of students believed that PM E&T would prove to be 'useful' or 'very useful' for employers beyond the MOD.

After 6 months in post, views on the reality of the utility of PM E&T to students' own teams had changed significantly, with a sizeable reduction in the proportion - 65% - reporting PM E&T as 'very useful' or 'useful' and some 35% of all students believing the course to be 'of little use' or 'not at all useful' in the context of students' own teams. This finding flags concerns around the direct utility of the students' PM E&T to activity within their own teams – a theme returned to later in the context of RQ3.

Despite this reduction in the reported utility of PM E&T to students' own teams, at the same time (i.e. after 6 months in post) almost the exact same proportion as at Baseline - 83% vs. 84% - still believed that PM E&T was 'very useful' or 'useful' to the *MOD in general.* Moreover, an increased proportion - 89% of students - now believed that PM E&T would be 'very useful' or 'useful' to potential future employers beyond the MOD.

Comparable figures were found to apply after 12 months in post, although there was an increase in utility to the current team (from 65% to 75%). In other words, there was a continued belief that PM E&T held greater utility to employers beyond the MOD, than to students' own teams and to the MOD in general. Again, to put it another way, PM E&T continued to be considered as important, if not more important, for students' longer term career prospects (looking beyond the MOD) than to their immediate roles.

A key finding, therefore, is that students consistently believe that the utility of their PM E&T is as great, if not greater, for organisations beyond the MOD than for the MOD itself.

These results are summarised in Figure 4.1 below.

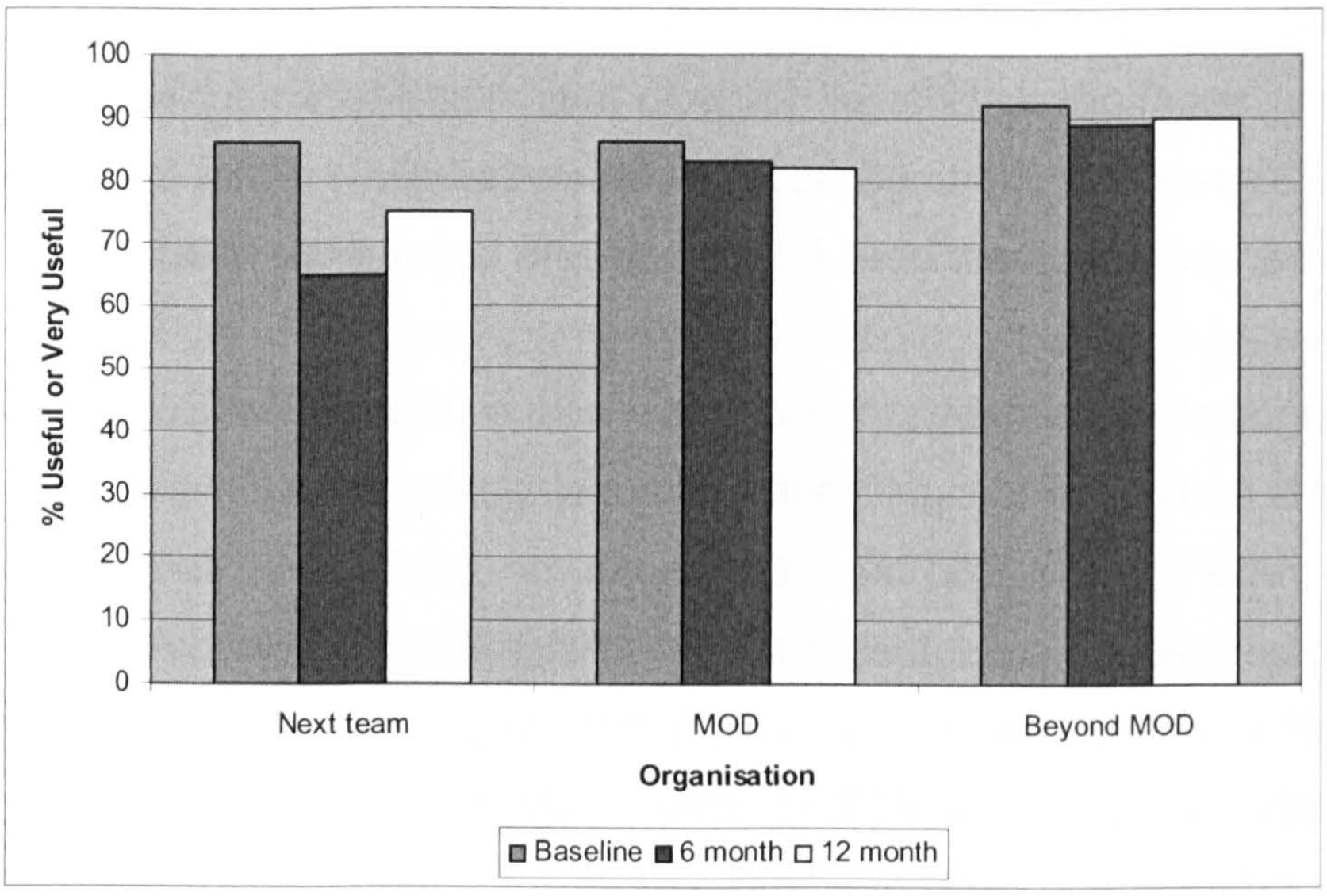

Figure 4.1 Usefulness over time of PM E&T to organisations.
(Baseline, n=51; 6-month, n=37; 12-month, n=27)

RQ1d: Which aspects of PM E&T are believed to be the most valuable?

Students' PM E&T comprised central lectures, case study work and related exercises over a 4-week period[70] and culminated in the students sitting the APMP examination. Individual central lectures were given on ten of the key APM Body of Knowledge (BoK) topics[71] and the case study itself was built around MOD's project life cycle (CADMID) and used to bring to life many of the taught principles and techniques. One objective of the research is to understand the relevance and value of these topics to students at the outset, as they transition to the workplace and then go on to work in a project environment.

The results for mean value of usefulness over time for the taught subjects are given in the Table 4.1, ranked according to their utility at the time of Baseline survey. It can be seen that at the time of the Baseline, Project Life Cycle and Risk Management were found to be the most useful topics taught, whilst Estimating and Soft Skills were considered to be the least useful.

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[70] The PM component of the course was taught over 4-weeks but accounted for approximately 40% of the total course content, the balance being made of Systems Engineering and other technical topics, including a 2-day visit to industry.

[71] The APMP Body of Knowledge includes 52 topics, 37 of which form the syllabus for the APMP exam. Key topics (e.g. Life Cycle, Investment Appraisal, Scheduling, Risk Management etc.) are covered in Central Lectures. Other topics (e.g. Requirements, Post Project Review) are addressed as part of the case study exercises. The 3-day consolidation course addresses the balance.

BoK Topic	Mean Value (4 = Very Useful, 3 = Useful, 2 = A Little Useful, 1 = Not at all Useful)		
	Baseline(*n = 51*)	6 Month (*n = 37*)	12 Month (*n = 27*)
Life Cycle	3.45	3.19	3.30
Risk Management	3.37	3.00	2.93
Scheduling	3.18	3.38	2.93
PM Terminology	3.06	3.24	3.22
Investment Appraisal	3.04	2.81	2.93
Resource Management	3.02	2.54	2.63
APMP Course	2.86	2.76	2.74
Organisation & Roles	2.82	2.76	2.63
Budgeting & Cash Flow	2.80	2.69	2.19
Earned Value Mgt.	2.71	1.92	2.00
Estimating	2.71	2.16	2.22
Project Soft Skills	2.67	2.49	2.78
Warehouse Project	2.67	2.05	2.15

Table 4.1 Utility over time of PM E&T taught subjects.

Also, whilst there was some level of support for all taught topics over time, not all students were convinced of the need for certain skills (e.g. Estimating, Budget and Cash Flow Management). Others regarded some subjects as a skill only used only by specialists (e.g. Earned Value Management). In contrast, almost all students recognised the usefulness and relevance of Risk Management and Investment Appraisal and both Scheduling and Lifecycle were also acknowledged as being useful by over 85% of students.

In addition to the APM BoK topics, views on other components of the course were also sought namely, PM Terminology[72], the Warehouse Project Simulation[73] and the APMP exam[74,75]. The learning of PM Terminology was found to be one of the most useful aspects of the course. Over 92% of students found this aspect of the course to be 'useful' or 'very useful' at the time of the Baseline.

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[72] Not an APM BoK topic in and of itself, but taught as a theme that underpinned all central lectures.
[73] An exercise over 2-days where students plan, execute and evaluate a project.
[74] The APMP consolidation course ran for 3-days and was used to prepare students for the APMP examination – a foundation PM qualification. This is treated as an integral part of students' PM E&T.
[75] Cohort 4a achieved a pass rate of 75%; Cohort 4b 60%.

Also at the time of the Baseline, a significant majority – 78% - believed that taking and passing the APMP would be a 'useful' or 'very useful' qualification whilst the Warehouse Simulation Exercise met with mixed support. A slim majority – 53% - considered it to be of 'little use' or 'not at all useful'.

After 6-months, Project Scheduling was found to be the most useful topic, followed by PM Terminology. After 12-months, the situation remained very similar to that at 6-months with three notable exceptions. Firstly, the utility of both Project Scheduling and Budget and Cash Flow fell markedly. Secondly, the utility of Soft Skills having fallen after 6-months now increased and exceeded the Baseline value. Finally, whilst the general trend for the utility of topics was downwards (i.e. topics becoming less useful over time) the utility of PM Terminology[76] increased after 6-months and remained at that level after 12-months. The results of this analysis are presented in Figure 4.2 below:

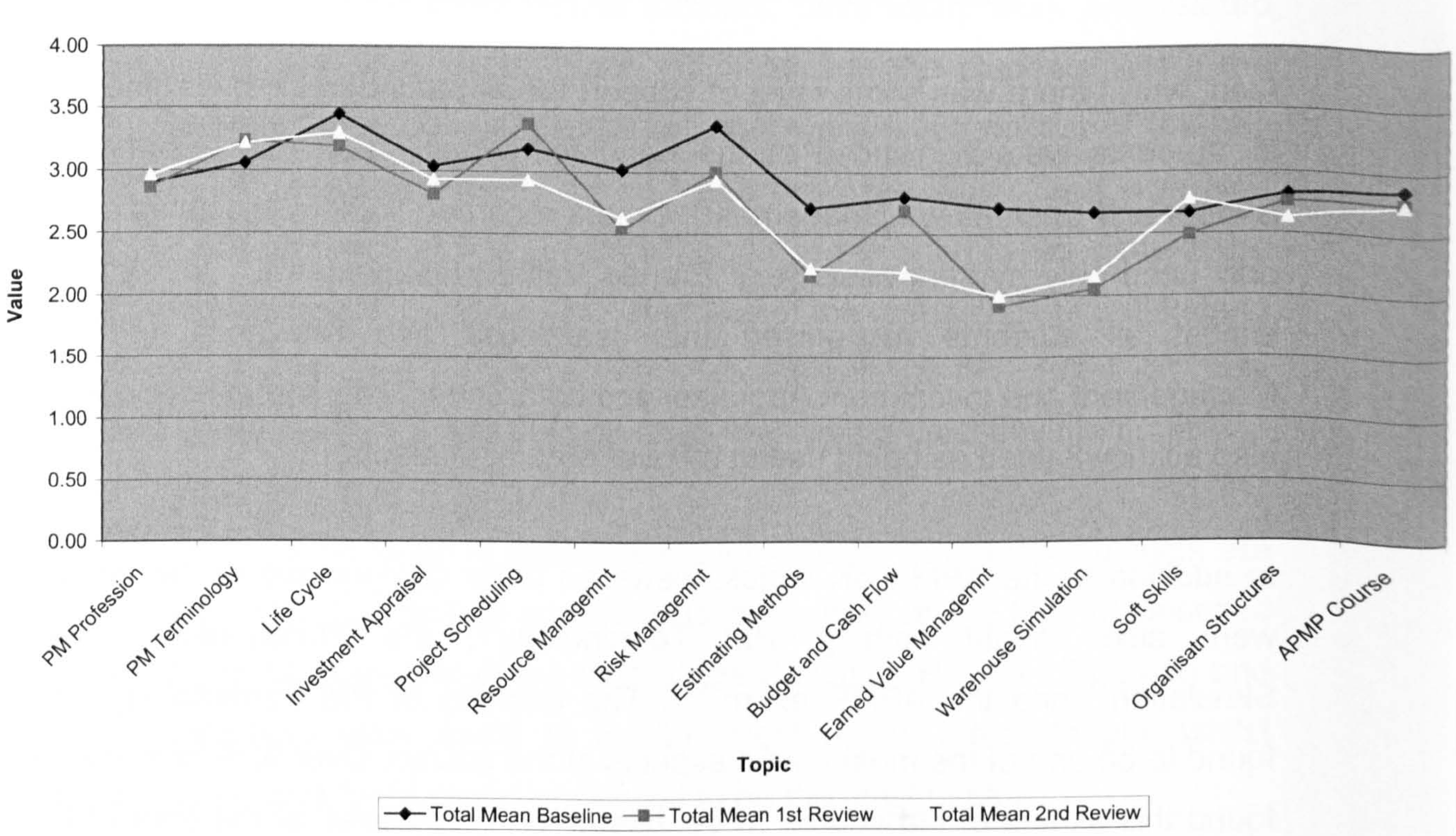

Figure 4.2: Body of Knowledge Topics: Utility over Time
(n=51, 37 and 27 at Baseline, 1st Review and 2nd Review respectively)

[76] Further findings relating to PM Terminology are presented below in Section RQ2c.

RQ1e: Did matters covered in PM E&T leave any gaps?

At the time of the Baseline survey, the majority of students – 65% - believed that there were no gaps in their PM E&T. The gaps reported by the remaining 35% of students were found to fall under 3 main headings:

- Job specific skills - in particular Requirements Management and Integrated Logistics Support (20%);
- MOD context – a need for more information on MOD politics, strategy, structures and 'corporate processes' such as planning (10%), and
- Specific PM tools – notably Microsoft Project (5%).

After 6-months in post, an increased proportion - 40% - of students reported 'job specific' aspects as being gaps that had affected, or were affecting performance. Worthy of note here are gaps reported by students in the roles of Requirement Managers, Capability Manager and Integrated Logistic Support specialists. These findings reflect the cross section of roles as previously described (See Section 3.2.5 and Table 3.2) and support the premise that PM E&T provision was a better 'fit' for some roles than for others. However, even in cases where arguably there was a less than complete 'fit', some positive statements around the utility of PM E&T were received. The quote below comes from a Capability Manager at the time of the Initial Review:

> *As a Capability Manager I have had little chance to use the skills learnt on TechET directly. However it has enabled me to add value in discussions with the project teams I support, and during dealings with industry. It has given me additional tools to manage the tasks I undertake on a daily basis and a better understanding of the processes across DE&S and industry.*
>
> Army Major 24

The gap perceived in MOD context widened over time. After 6 months[77] in post, 25% of students (up from 10% at the time of Baseline) believed, that more MOD context was required, in particular around equipment planning[78] and commercial processes. Other gaps[79] identified included Programme Management (15%), Through Life Capability Management and Systems Engineering (10%).

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[77] No data relating to this question was gathered at the time of the Final Review, working on the assumption that gaps would have been identified by that time.

[78] This refers to the process of aligning funding to capability gaps, as distinct from 'project planning'.

[79] It is worth noting at this juncture that this research and other findings based on course evaluation resulted in significant changes to the structure of military Employment Training after May 2009.

RQ1: Student views on their experience of their PM E&T: *Summary*

Students come to the course with a generally low level of familiarity with the PM discipline and a relatively high degree of disregard for the relevance of the discipline to their military careers. However, over time the findings suggest that students become more convinced of the relevance and usefulness of PM. Moreover, students considered the utility of their PM E&T to be as great, if not greater, in the medium and longer term, both for the MOD in general and organisations beyond the MOD, than they did for their next posting and their respective project teams. At Baseline, and over time, all taught topics were ranked as being more than 'a little useful' with Scheduling, Risk Management and in particular, PM Terminology consistently found to be the most useful. In the case of the latter, PM Terminology, together with Soft Skills, utility increased slightly over time in contrast to a general downwards trend in topics' utility. Finally, some gaps in PM E&T were found, especially with regards to 'job specific' and MOD contextual aspects, many of which have since been addressed as part of the successor course, AET.

RQ2: What are the beneficial changes over time as a result of PM E&T?

RQ2a: At the level of the individual / project / organisation?

The class room based PM E&T experienced by the students was delivered at the level of the 'isolated individual'. That is to say, no attempt was made to include other members from the students' future teams, or to include representatives from functions in the wider organisation. However, whilst the PM E&T itself was aimed at the level of the individual, the research was interested to identify changes that had taken place over time at various levels - Berggren's 'spaces' – namely, the individual, team and wider organisation.

At the time of the Baseline, it was found that the PM E&T experience resulted in a number of significant impacts and influences on individual students. Firstly, there was acknowledgement of the 'broadening of outlook' and an appreciation of 'different perspectives' as the following quotes serve to illustrate:

> *It (PM E&T) broadened my outlook on management techniques and processes.* Army Major 2

It has certainly given me the perspective from a civilian organisation point of view and although the military have a number of projects, we are far from the experts and must learn from our industry partners. Army Major 8

I get involved in a number of different projects...not managing any of them, but being familiar with the terminology is useful in terms of just understanding it....(especially) starting projects. Army Major 10

PM E&T also touched people's personal lives:

On a personal note, I'm repairing a property at the moment and I have applied some of the lessons on the process which has been interesting. Army Major 25

And influenced thinking around career options and ongoing development:

Developed my interest in Project Management as a future career. Army Major 26

It has shown me how I can continue to educate myself in this area. Army Major 19

There was evidence of improved understanding of the 'bigger picture' and generally feeling 'better prepared' for future roles:

The TechET training closely reflects the reality in DE&S. TechET has provided me with a depth of understanding and subsequent confidence that was lacking before my course. Army Major 17

Competence in the management of complex tasks.....I feel it has prepared me for my role in an IPT. Army Major 13

As was found earlier (see RQ1d) there was recognition of the positive changes as a result of being able 'speak the language' of 'civilian' project management:

Understanding of the terminology used in the civilian world of project management will allow me to better engage...it has been a key change. Army Major 15

Prior to the course I had no understanding about the process of PM work. I am now directly involved in the FRES project. I now understand how the system works, the terminology and the processes. I am completely at ease in meetings and can add value where required. Army Major 21

And recognition even at this early stage, of the need for behaviour change:

I think that it has reinforced there is a generational thing within the MOD that is changing for me...there are people who are coming in now who are more radical than perhaps I was a couple of years ago... So you generally tend to get slow, evolutionary change, probably as people go away and learn something like this. Then it feeds back eventually. I would say that most of the SO1s[80] are probably the loose cannons. Army Major 2

[80] SO1 is the rank of Lieutenant Colonel i.e. one rank above that of Major (SO2).

And again for more consistent ways of working:

> *I was doing a job three years ago where I was the user input to a military project ...I was very, very junior in terms of I was a Captain...we could have been a lot cleverer in the way in which we managed that interface...this should change as we begin to get consistent ways of doing stuff.*
>
> Army Major 2

After 6 months in post, findings indicated increased confidence and clarity around what PM meant to students and how PM principles, tools and techniques could be applied to a range of 'projects':

> *Somebody sent me a Gantt chart and I went straight to Microsoft Project, opened it up and used it and understood it..... In the summer I've got to take men and vehicles to Jordan, well five years ago I'd have just done that, now I'm looking at it as a project because it is.* Army Major 7

There was also evidence of a 'maturing of attitude' around, for example, how work could be (and should be) done and the adjustments needed to work in an environment that was different to a traditional military hierarchy, including also emerging programme management[81] practices:

> *I probably had a military attitude in the sense that I thought if you went in and asked for something, or stated something, then there would be an end result at the end of it. Whereas in the acquisition world nothing happens quickly...and I think you have got to approach things in a far more diplomatic manner than perhaps I would have done in the past.*
>
> Army Major 17

> *Bearing in mind I'm now working at programme level, how it all feeds in, so how your projects feed into your programme, who controls what, who are the key decision makers...the overall hierarchy.* Army Major 11

Also, and again at the time of the Initial Review, a number of other changes at the level of the team and wider organisational began to emerge, for example, the need to improve communications:

> *And so communication amongst all of these people (involved in UOR[82]s) is important. And then when it gets into here, communication with the project manager to the support office to his line manager, and also to others that have delivered that type of project before is important...and it's something that DE&S is terrible at, communication.* Army Major 8

In contrast, the volume and pace of change within the MOD brought out other concerns which argued for a period of 'stability' in both organisation and staff:

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[81] A 'programme' is defined a s a group of related projects (BS6079). Programme management was not the focus of this research but is included here as evidence of benefits of PM E&T in a wider business context and specifically Through Life Capability Management (TLCM) in the MOD.
[82] UOR: Urgent Operational Requirement.

We need to allow the process to settle rather continually chasing change.
Army Major 29

Continuity....and how we probably don't do project management very well because we don't have the people running a project, we have people who dip in and out of it at various stages.
Army Major 2

After 12 months in the work place, 92% of students responded positively to their having been 'many' or 'some' useful changes to them as individuals as a result of their PM E&T. At the level of the team, 77% of students said that there had been 'some' useful changes, but the balance, 23%, said there had been no beneficial changes. Similar results were found for the MOD as a whole. Drawing further on comments made after 12 months:

I do not think it is changing at all as the wider Army is not educated in the ways of PM.
Army Major 7

I think negotiation is very important. Coming from a military background, we negotiate quite abruptly because we're military, curt I think is a good word, and we don't take offence. But I've noticed that if you are quite forceful – not rude – it becomes destructive rather than productive.
Army Major 17

PM should become an integral part of our processes that is understood by all to some degree – not just those who practice it. This would ensure that those who are not practicing still understand the issues and outputs.
Army Major 28

In summary, it could be said that the principal beneficial changes that appear to have taken place as a result of students' PM E&T were found to be predominantly at the *level of the individual.* These included changes in personal perspectives, perceptions and attitudes as well as enhanced knowledge and skill. However, whilst there was some recognition of the need for change at other levels or 'spaces' there were very few references to actual changes having been made at the level of the project, the team[83] or organisation. There were no references, for example, to 'improved teamwork' or 'better team performance' or 'more effective organisation' and this remained the case over time[84]. This theme is returned to later under RQ2c and RQ3b.

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[83] One exception was found to be a shift in emphasis in the use of PM Terminology presented as part of RQ2c.
[84] There were, it has to be said, some references to 'more effective use of resources' and 'improved decision making' which could be argued to be the result of changes beyond the individual.

RQ2b: How relevant is PM to students' military / future careers

As reported in RQ1a above, students embarked on the course with limited prior PM E&T and perceptions that, in general, were neutral towards the relevance of such education and training to their own military careers. However, following, and as a result of their PM E&T, there was a significant shift in students' attitudes and their perceptions of the relevance of PM[85] as Table 4.2 shows. Before the course, 41% of students believed PM to be 'extremely' or 'very' relevant and 11% to be 'not at all relevant' to their military careers. Following the course, 81% of students believed PM to be 'extremely' or 'very' relevant:

Category	Before the course (%) *n = 51*	After the course (%) *n = 51*	After 6 Months (%) *n = 37*	After 12 Months (%) *n = 27*
Extremely Relevant	5.4	24.3	35.1	19.2
Very Relevant	35.1	56.8	40.5	50.0
Fairly Relevant	48.6	18.9	21.6	23.1
Not at all Relevant	10.8	0	2.7	7.7

Table 4.2: Relevance of Project Management to Students' Military Careers

This realisation by students' of the relevance of PM to their military careers was identified as a key benefit of their PM E&T. In line with earlier findings (see RQ1b) the extent to which students perceived the relevance of PM with regards to their own careers varied according to the individual student's background. Technical corps (specifically, Royal Engineers and REME) were found to be more 'comfortable' and appreciative of the PM subject than other less technical regiments (e.g. Infantry) – a point made also in respect of potential response bias (see Section 3.5.2.2).

Also at the time of the Baseline, some students perceived there to be parallels between 'military operations management' and PM, although the specific linkages and precise similarities between the two were not always clear nor for that matter, believed to have been acknowledged by the (MOD) organisation as the following quotes indicate:

[85] Please Note: this refers to the relevance of 'Project Management' as opposed to PM Education and Training, the subject of RQ1.

> *An awful lot of what we do, certainly as junior officers and probably the NCOs as well, is project management by a different name.* Army Major 1

> *There are lots of different military tools which have elements of project management....but we are seeing it from a completely different perspective....I had a rough understanding and now have seen how the military have maybe doctored an approach that someone else has used. I think it's brought a lot more structured approach to a lot of things we do probably subconsciously.* Army Major 2

Indeed, recent changes in the nature of military operations have perhaps been a factor in bringing about a closer relationship between 'military operations management' and project management, as one student put it:

> *During the Cold War we sat in Germany practising the same exercise every year for when the Russians come across. That wasn't a project in the same way as 'go and fix Iraq for 5 years' or 'go and fix Afghanistan' in an expeditionary operating environment today.* Army Major 1

Referring once again to Table 4.2, after 6 months in post the percentage of students that believed PM to be 'extremely' or 'very' relevant to their military careers had reduced from 81% (at Baseline) to 76% although a greater percentage (35%) now considered it to be 'extremely useful' than was the case at the time of the Baseline (24%). At the time of the Final Review the proportion that believed PM to be 'extremely' or 'very' relevant to their military careers had reduced further to 69%.

These findings suggest a gradual reduction in the actual relevance of taught PM in the work place based on the reality of students' experience and role in that environment. This reduction in the relevance of PM to military careers over time is a key finding and is discussed later in Chapter 5. At this juncture, suffice it to say, that this reduction in perceived relevance may be a consequence of the 'disconnect' between what students were taught as 'general' PM principles, and what they subsequently found to be practised in the own individual teams and work situations.

Nevertheless, despite this reduction in the relevance of PM over time for some students, there is considerable evidence of changing perceptions and attitudes towards a greater appreciation of the PM discipline:

What I've found is that I now have a better understanding of how the military do project management, but perhaps more importantly, how industry do it. Army Major 7

It's change positively – that what I learnt and what I've read about since, it's imperative that we do that. Army Major 8

Certainly, it's definitely been a help having done the training….because a lot of the stuff you use…if nothing else it just triggers something, you go like, oh yes, I know what he's going on about, or I an go and have a look in my notes. Army Major 10

Also by the time of the Final Review, the importance of PM to the MOD and the relevance of PM to a majority of students' future military careers had been firmly established. At this time, after 12 months in post, 44% of students believed there would be greater emphasis on PM in the future, whilst the balance, 56%, believed that the situation would remain the same. Not a single student believed that there would be a reduction over time in the importance of PM to the MOD or to their job related priorities and responsibilities. This apparent 'future proofing' of students' careers as a result of their PM E&T was considered to be a significant outcome:

I now have a set of skills and a knowledge base that can be utilised in any job, military or civilian. Although no particular changes in my current job, it (PM) at least gives me further potential in the future. Army Major 31

RQ2c: What have been the benefits arising over time from PM E&T?

A key benefit of PM E&T already commented on under RQ1c and RQ2b, is that of an early and ongoing appreciation of the relevance of PM to individual student's own careers.

Further findings from a thematic analysis of qualitative data relate to the question of specific benefits arising over time from PM E&T and are grouped under the following three headings:

i. Terminology – that is to say, 'learning the language' of PM;
ii. Contextualisation – an appreciation of the wider project environment; and
iii. Tools & Techniques – and their application in the workplace.

RQ2c (i) Language of PM

An immediate, and key benefit of PM E&T was the opportunity to 'learn the language' of the PM discipline. Evidence of this has been presented under RQ1d as being one of the most valuable aspects of PM E&T (see Table 4.1 and Figure 4.2). To re-iterate here, at the time of the Baseline, 92% of all students found an awareness of PM Terminology to be 'useful' or 'very useful'. This figure reduced to 77% after 6 months though picked up to 85% after 12 months, perhaps as students internalised and then reinforced their learning. Statements made after 6 months in post underlined the significance of this benefit:

> *The training has enabled me to be more effective in my role through understanding terminology, common documentation and project phases. I wasted 4 months in post before completing the training and understanding what I should be doing.*
> Army Major 17

> *I feel confident with the common language I learned to be able to go in and interface with people. In fact I actually asked someone recently what type of organisation he worked in – whether it was project based or matrix – and he talked back in terms which I understood.*
> Army Major 6

> *Having a broader understanding of terminology and how it is practised outside of a blinkered MOD view has been extremely useful.*
> Army Major 10

> *Understanding the terminology used in the civilian world of project management.*
> Army Major 15

Interestingly, after 12 months, the focus of some references relating to the benefit of learning the PM Language shifted from the individual to the team – an example where the team appear to have benefitted as a result of an individual's PM E&T[86]. For example, we find the following statement at the time of the Final Review:

> *After a year in post, the training has enabled me to be more effective in my role through an understanding of terminology....knowledge of the language has allowed me to follow conversations and be confident in contributing to the team.*
> Army Major 28

One student related the following story to highlight the potential benefit to be had from the greater use of more standard PM terminology:

[86] See findings presented under RQ2a for further details supporting this statement.

> *Consciously, I can't think of ever couching anything in PM terms exactly – and I have done numerous projects in the military. The last one I did was in the signals brigade. They had just bought a whole new raft of signals equipment and hadn't bought equipment to power it up. I can't remember calling it a project – but is definitely was a project. Perhaps getting us to talk in those terms we would have looked at it in a different light and apply the tools and metrics necessary to formalise them as projects.*
>
> Army Major 4

Another student put it in these rather more concrete terms:

> *I don't think I will change my style of how I do a project because again through my cap badge I have done quite a lot….but I am now more aware from the civilian point of view how they look at it, how they perceive it and the terminology used. In that sense, I have changed my ways…I will be more aware of what people are talking about.* Army Major 5

A key finding, therefore, has been the importance of understanding PM Terminology, in effect, learning the PM language. This ability to speak the language enables individuals to communicate more effectively internally, across the team and also externally with industry partners. The importance of this benefit is consistent with the work of Lave and Wenger (1991) who, in discussing the concept of 'apprenticeship' in the workplace, acknowledge the importance of not only 'talking about' but crucially 'talking within' a community. Students, as 'apprentice' project management practitioners' clearly benefitted from an ability to 'speak within' even though as we shall see, there is very little evidence of 'community' in the way that Lave and Wenger intend it to mean.

RQ2c (ii) Contextualisation

Projects are not delivered in isolation of the wider organisation, and by their very nature, involve multiple interfaces and potentially many interdependencies. Recognising this context and being able to respond accordingly is therefore necessary if projects are to succeed. Findings from the Initial Review highlight a key benefit of PM E&T as being a greater appreciation of 'the bigger picture' resulting in an improved understanding of the complexity of the wider business and in particular the role of the MOD as a Customer and industry as a Supplier, allowing the students to act – and re-act - accordingly:

> *I am now more aware of those areas that will have a direct impact on the project….and what is on the critical path…an example was deciding on what length the vehicle should be, the delay in advising industry could have seen the project delayed by some considerable time.* Army Major 21

> *I have been doing an awful lot of the techniques and a lot of the stuff in my daily work without contextualising it into that particular form of language....everything is a little project...you have various different methods of dealing with all those different things which you can contextualise ...and doing it in a more joined up fashion.* Army Major 2

> *It has put the military acquisition process into a wider context – and highlighted why we get it wrong so often!* Army Major 14

One student put it like this:

> *It has highlighted to me how complicated the whole issue of PM becomes with Defence related projects. I now have a better understanding of the bigger picture, de-risking, ITEAP[87], TLCM[88] etc. Not only do I appreciate the complications of project management, but also can now advise and offer possible solutions.* Army Major 21

Another in these words:

> *The training was a good background and gave me a general awareness of project management...my further development is likely to be hindered by the decision to limit training funding in the Centre.* Army Major 27

The ability to see this 'bigger picture' has been presented as a key benefit of PM E&T. However, with such improved insight comes the risk that corporate weaknesses are exposed which, if beyond the control of the incumbent, may lead to frustration and potential de-motivation:

> *Personally I have found my PM training to be hugely beneficial. I have learned more in the last year than at any other point in the past 5 years. The flip side of this is that my education has exposed serious flaws within the military that are wide spread and endemic. This has resulted in becoming exceedingly frustrated as I keep seeing missed opportunities and a failure to learn from past experiences. I feel that at my level I am unable to influence the chain of command and subsequently I believe that little will change in the future.* Army Major 22

More is said in connection with this and related barriers as part of RQ3. Suffice it to say here that improving PM knowledge and understanding brings benefit in allowing students to appreciate a wider project context, the political, environmental and economic perspective that underpins project strategy. However, this greater awareness also introduces the risk that the reality of the workplace - its project structures, roles and responsibilities - may fall short of students' now elevated expectations of project practice.

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[87] ITEAP: Integrated Test, Evaluation and Acceptance Plan, used to ensure effective transition of capability to operations.
[88] TLCM: Through Life Capability Management – in effect the MOD's method for applying the principles of programme management.

The work of Thomas and Mullaly (2008) examined the drivers of 'value' associated with the implementation of project management. It is interesting to note here that one such driver was that of "aligning Organisation" and specifically, "the degree to which there are consistent decision making structures, roles and processes in place" (2008: 203). It follows that value from PM will not be fully realised where there is a less than completely aligned organisation – as the evidence here indicates may be the case, a point discussed further in Chapter 5.

RQ2c (iii) PM Knowledge and Skills

It has already been seen (RQ1d and Table 4.1) that there was some level of support for all taught PM topics. Here it was noted that not all students were convinced of the need for certain skills (e.g. Estimating) whilst others regarded some subjects as a skill only used only by specialists (e.g. Earned Value Management). In contrast, at the time of the Baseline it was found that almost all students recognised the relevance of Risk Management, Investment Appraisal, Scheduling and Lifecycle.

This perception of the relevance of PM topics (given that at Baseline students had no experience of their application) was subsequently borne out over time and enhanced PM knowledge and skills represents a further and very tangible benefit of students' PM E&T. Specific examples of the application of PM E&T in the workplace emerged during interviews and were typically in respect of three main topics: Scheduling, Project Definition and Risk Management. One student had this story to tell in connection with Scope Definition:

> *I sat in the café in Kandahar with a project manager from an IPT at Abbey Wood and we discussed work breakdown structures[89] on the project that we were working on, and how we were going to do the integration of this platform in theatre. And I sat there and I was laughing because I was actually using what I was taught.* Army Major 7

Others in connection with Scheduling:

> *Yes, the Gantt chart jumps out at me as a perfect example of ensuring that everything we see as the scope is represented .... we don't simply stick to the chapters of the project, but we understand the paragraphs as well....Are*

[89] Work Breakdown Structures is the technique used to 'map out' a project's scope – what the project is, and what it is not – in increasing levels of detail as a basis for discussion and agreement.

you going to hit your IOC[90]? No? Why not? I don't know. Where's your Gantt chart, it'll tell you on there why you've moved to the right.
Army Major 8

Scheduling of project work has been improved and understanding of how full time PMs operate and the pressures they are driven by. Army Major 2

Evidence of the application of a number of other taught topics was also found to bring benefits:

Risk management is pretty fundamental, and the whole scheduling part, success criteria .....all the, what I would view as important parts have been relevant. Army Major 7

The application of PM techniques has been positive. This is particularly true within the Loitering Munitions programme regarding the demanding timescales, rapid development and rapid prototyping that has happened. So for example, we've all done stakeholder management – it's your boss, the people you work for and who work for you…but I have never structured it in that fashion before….I have never really looked at it in terms of management process. Army Major 28

Contractors and MOD staff now fully understand the life cycle. Projects around areas of commonality and information are grouped into distinct life cycles areas. Army Major 17

I am attempting to put into place the correct change configuration processes for projects to ensure we maintain visibility of these changes.
Army Major 19

Understanding Project Management enables more efficient use of staff time. Army Major 18

Finally, even when students had no project specific responsibilities, value was added through the application of principles taught as part of PM E&T:

My current role (Requirements Manager) is extremely varied between different teams. Personally, I am not responsible for project management. However, I have been able to give advice on many aspects including scheduling, risk management and change management. Army Major 32

Understanding how tools and skills can be sued as part of a sequenced set of deliverables rather than a gifted amateur approach and learning through exposure and on the job training. Army Major 10

The benefit associated with greater PM knowledge and the practical application of PM principles pre-supposes a common approach is adopted. Again, in their work on the value of PM, Thomas and Mullaly (2008) for example, stress the importance of "aligned Project Management" where there are "formal project

[90] IOC: Initial Operating Capability

management processes in place, which are consistently embraced and utilised by virtually all projects within the organisation" (2008:203).

We shall see later (RQ3) that this consistency is not a given in the case of the MOD, and indeed, this research has found that there are in fact significant issues associated with, for example, local practices and different ways of working that constitute barriers to the realisation of value from PM E&T.

RQ2d: What are the main influences that shape students' work?

Data was collected pertaining to the factors that influence and in some way shape students' way of working – without taking a view as to whether these were helping or hindering influences (consideration of which follows under RQ3). The results obtained are summarised in Table 4.3 and in Figures 4.3 and 4.4 below.

Ranked	PM E&T	Previous Experience	Project Team	Team Leader	Sponsor	Industry
1st	19% (15)	24% (41)	27% (15)	14% (7)	11% (19)	5% (0)
2nd	8% (33)	24% (15)	24% (11)	19% (19)	16% (7)	8% (15)
3rd	30% (15)	16% (22)	11% (22)	19% (15)	14% (19)	14% (7)
4th	16% (7)	11% (7)	30% (30)	19% (30)	8% (11)	11% (19)
5th	16% (15)	8% (7)	5% (19)	16% (26)	24% (19)	24% (11)
6th	11% (15)	16% (7)	3% (4)	14% (4)	27% (26)	38% (48)

Table 4.3 Initial (Final) Review: Ranking of Influences in the Workplace ***(n=37, (n=27))***

It can be seen that after 6 months in post, the primary influence was found to be the 'project team' – attracting 27% - with 'previous experience' being the second most popular primary influence with 24%. 'PM E&T' attracted 19%. Put another way, these three factors combined accounted for 70% of all primary influences. The least influential factor was found to be 'industry' – with only 5% of students ranking this as their primary influence (62% of students had this as their 5th or 6th most important influence). Overall, taking 1st and 2nd rankings together, the 'project team' could be considered to be the most influential (51%) followed by 'previous experience' (48%) and 'team leader' (33%).

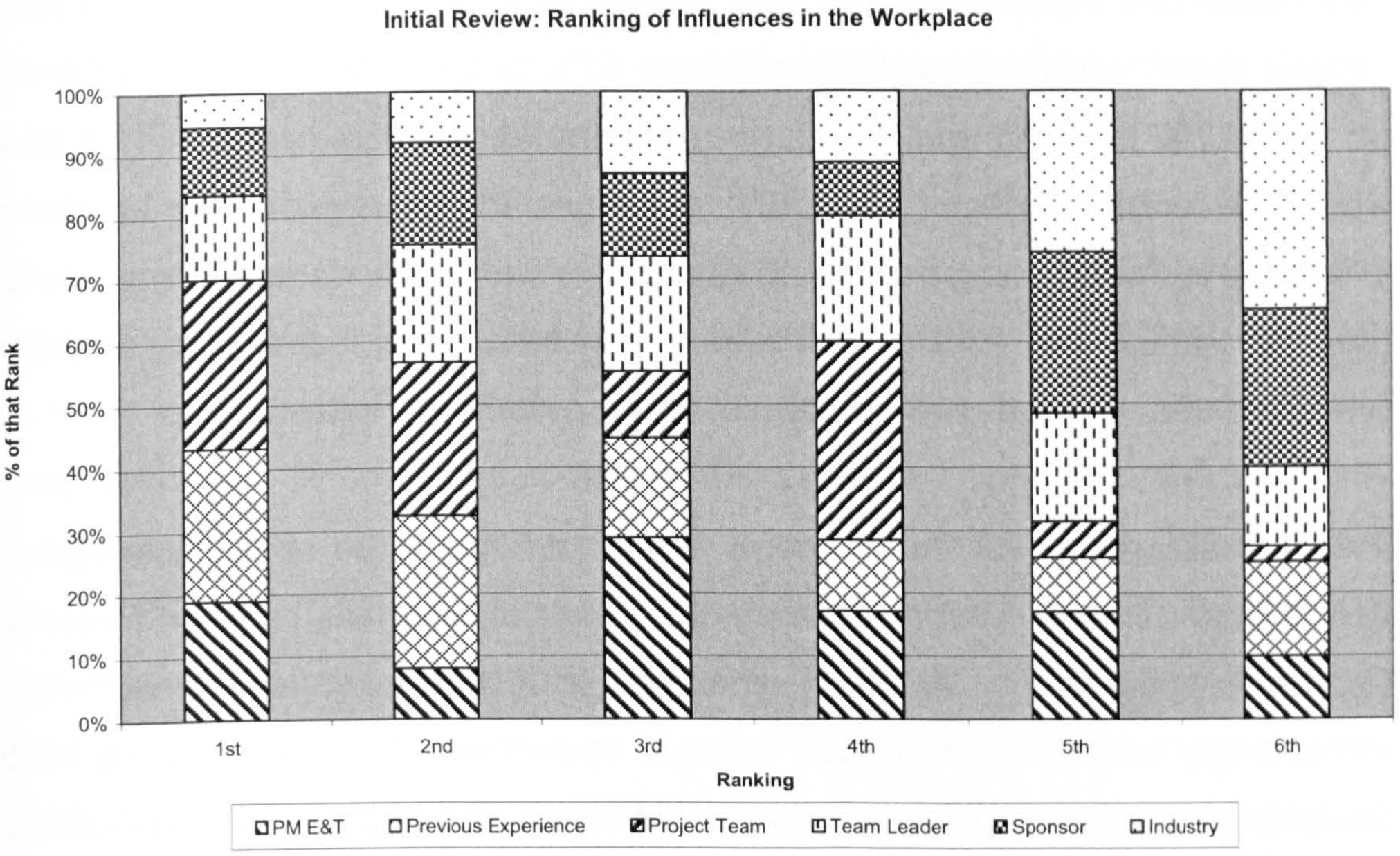


Figure 4.3 Initial Review: Ranking of Influences in the Workplace ***(n=37)***

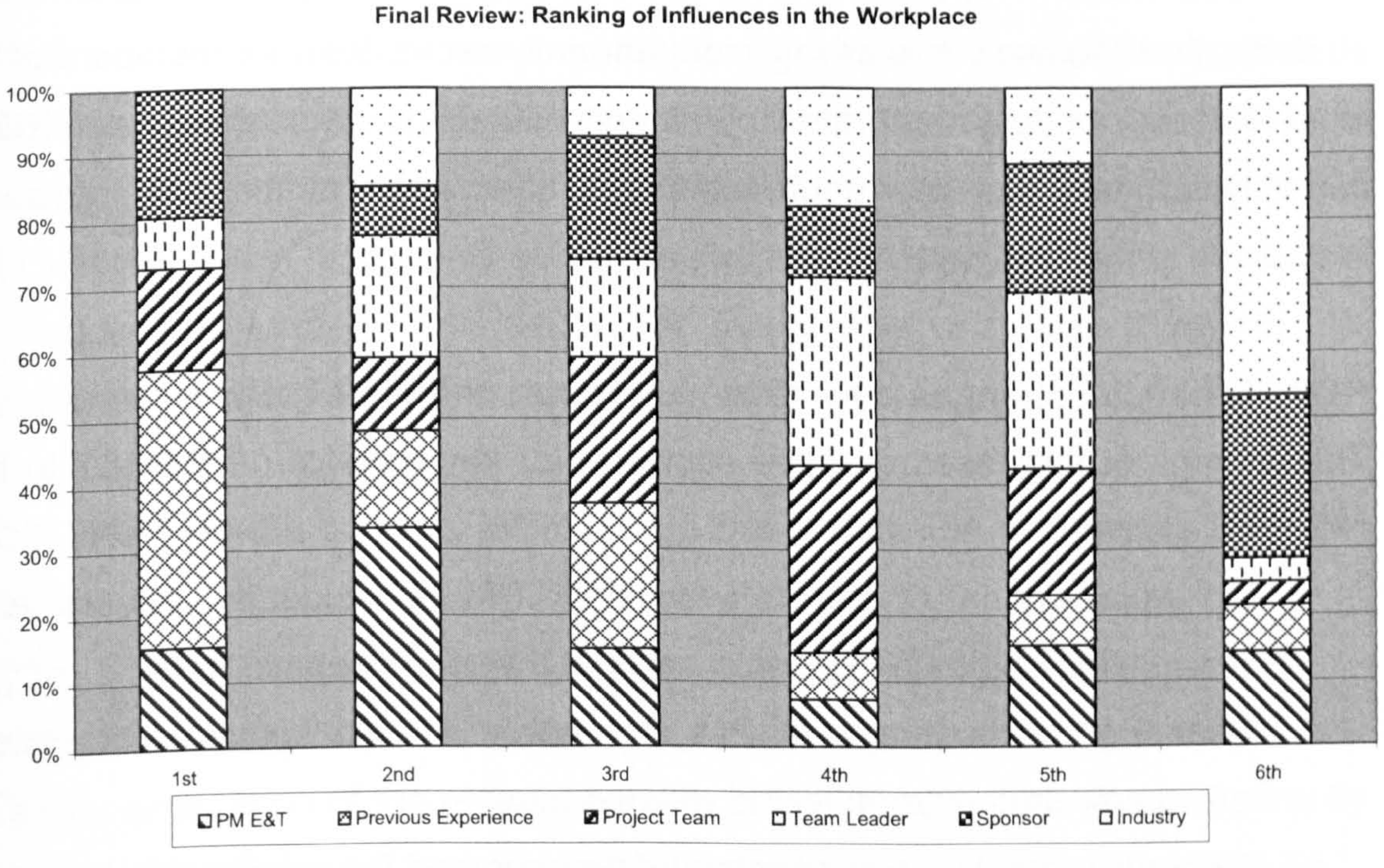


Figure 4.4 Final Review: Ranking of Influences in the Workplace ***(n=27)***

After 12 months in post, the primary influence had changed significantly. It was no longer 'project team' but 'previous experience' which attracted 41% of all 1st rank scores. PM E&T was ranked by 15% of students as their primary influence, and these three factors combined now accounted for 71% of all 1st

rank influences. Again, taking 1st and 2nd rankings together, the influence of the 'project team' had fallen significantly from 51% to 26%, behind PM E&T (now up from 27% to 48%) and the same as 'team leader' and 'sponsor' – all now with 26% of combined 1st and 2nd rankings. 'Industry' remained the least influential factor affecting how work was done – with no students ranking this as their No.1 influence. The overall influence of both 'team leader' and 'sponsor' remained very much as before, neither being a dominant influence.

These findings suggest that students – and perhaps to be as expected given their status as Army Majors - are employed in project posts first and foremost for their specialist military knowledge. However, from the outset, and increasingly over time, they look to draw upon their PM E&T believing in its benefits and assuming its universal application. Perhaps as a result of the rather low cohesion of the team, a general 'hands-off' management style of Team Leaders and Sponsors, and their own (relatively speaking) low rank, students find themselves working independently rather than as members of a close-kit team or fully integrated community. Findings presented under RQ3 certainly suggest that this approach might offer students the path of least resistance in their attempts to 'add value'.

RQ2. Beneficial changes over time as a result of PM E&T: *Summary*

The findings of this research have allowed four key benefits of PM E&T to be identified, namely:

- An appreciation of the relevance of PM to students' careers and recognition of the (longer term) utility of PM to organisations;
- Learning the language of PM and being able to communicate more effectively, both internally and with industry;
- Recognition of the wider context of defence and the relationship between that environment and project related activities; and
- Knowledge and skill in the application of appropriate PM tools and techniques across a range of activities, not only project specific tasks.

However, the majority of the instances where these benefits were reported were found to be at the level of the individual. Whilst students were not directly

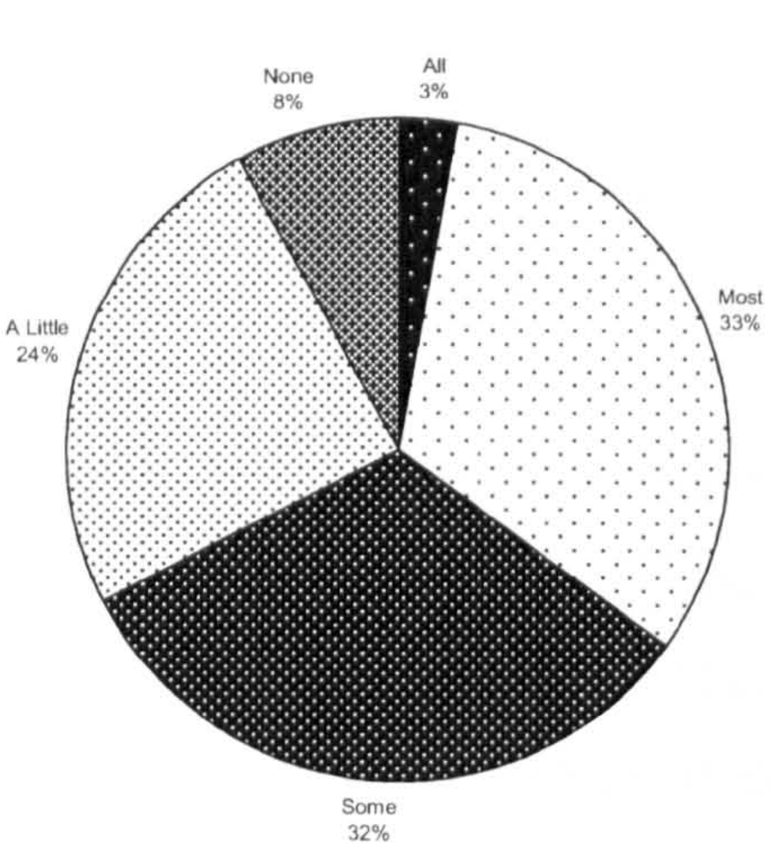
questioned about the topics of teamwork, it is still perhaps interesting to note that no reference was made to, for example, 'improved teamwork' or 'better team performance' as a benefit of their own PM E&T, nor for that matter, to 'enhanced organisational effectiveness'. PM E&T, delivered at the level of the individual clearly provided benefit at that level, but with little apparent penetration of such learning into 'higher' levels - or spaces - be it the team or the wider organisation. Moreover, the influence of the team in shaping how works gets done is never great, and in fact reduces over time, with students drawing upon their own experience and increasingly, their PM E&T as time passes. Also, the Team Leader and Project Sponsor appear to have relatively little influence in shaping how work gets done. That said, bringing about change at the level of the team is not an explicit objective of class room based, individually targeted PM E&T per se. One explanation for this apparent lack of impact of the individuals on their teams might therefore be found in contrasting the role of the 'project manager' with that of a 'change manager'. Crawford (2010) argues that these roles are indeed different and it could be concluded that an apparent lack of benefit from PM E&T in bringing about beneficial change in the 'team space' is a consequence of the very nature of the initial PM E&T intervention in terms of its scope, design, content and audience. We return to discuss this point further in Chapter 5 and again Chapter 6 where it is identified as an area for further research.

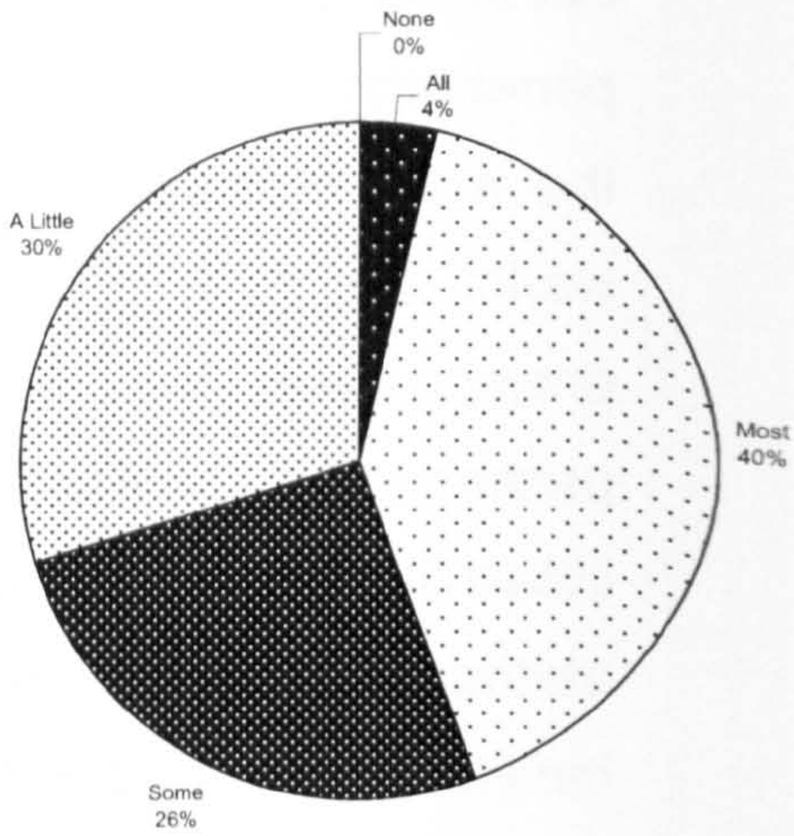
RQ3: What are the barriers over time to the realisation of benefits from PM E&T?

RQ3a: To what extent can PM E&T be directly applied in the workplace?

Related to the objective of understanding perceived or actual barriers was first of all an exploration of the extent to which students' were able to apply directly the principles, tools and techniques that were taught as part of their PM E&T. Clearly, in the event that taught principles could be directly applied, it might be concluded that working practices were consistent with those taught principles. In other words, practice is consistent with theory and there is therefore consistency and coherence with respect to both across the project environment.

Student views were therefore sought on the extent to which they could apply directly PM taught principles in their workplace and the results are presented in Figure 4.5 below.





Initial review (n=37) ***Final review (n=27)***

Figure 4.5 Proportion of PM E&T that can be applied directly in the Workplace.

After 6 months in post, 3% of students reported that they were able to directly apply 'all' of what they had learned whilst 8% reported that they had been unable to apply any of the learning. After 12 months in post, all students had by that time been able to directly apply their learning at least to some extent i.e. zero students reported 'none'. However, with regards to general applicability, the situation after 12 months remained much the same as it was after 6-months, with 66% responding 'most or 'some' (Initial Review 65%) and 30% 'a little' (Initial Review 24%). After 12 months in post, 56% of students were not able to apply 'all' or 'most' of what they had been taught. This relatively low level of application of learning may be due in part to the role of the student, and also the difficulties experienced in trying to apply what had been taught. It has already been noted that there was a wide range of student roles, some of which lend themselves to more direct application of PM E&T than others (see RQ1b, Section 3.2.5 and Table 3.2).

The section below presents the findings relating to the realisation of benefits over time, and specifically, the barriers that students experienced in applying their PM E&T in the workplace.

RQ3b: Are the benefits from PM E&T being realised over time? If not, why not?

A key objective of the research was of course to identify the barriers that students received or experienced in realising benefits from investment in PM E&T. At the time of the Baseline, the research was concerned with students' *perceptions* of what *might be* the factors that prevent the realisation of benefits from their PM E&T in the work place given their *expectations* of the workplace. At that time, thematic analysis of qualitative date identified student perceptions in terms of two main themes:

- clarity around organisation structures, roles and responsibilities including students' own role, and
- issues arising from cross organisational working, the lack of coordination and cooperation across different parts of the organisation due to different working practices and behaviours.

In respect of the first of these, students were concerned that 'direction' would be missing:

> *I would hope that someone could point me in the right direction, that the role is well defined.*
> Army Major 1

> *Default settings about where the focus is if it is going wrong, a governing stakeholder somewhere who you go and look for…I suppose a sponsor.*
> Army Major 2

Or that 'management' – employers effectively sponsoring students' attendance - would be unable to provide the context and boundaries within which they could subsequently operate and function:

> *Hopefully people who are there, both senior and junior to me, will also have an awareness of what this course has given to me so they know what to expect from me…they may otherwise give me things which you have no knowledge of or that are at such a basic level that you end up wasting time.*
> Army Major 5

> *Set parameters of where I have freedom of manoeuvre and where I don't…what my boundaries are and that sort of stuff…a way of working.*
> Army Major 2

> *An ability for me within the working environment within the headquarters, all the different staff branches and desks work constructively.....people knowing who does what.....and all being on the same side sort of thing...I feel like I am talking about personnel issues here rather than TechET.*
>
> Army Major 1

In total, these views point towards what Thomas and Mullay (2008) refer to as 'organisational alignment' being the degree to which there are consistent decision making processes, structures, roles and processes in place. Student concerns were that they would find a general weak organisational alignment. But it was the second of these themes, the possibility of various and different approaches to project work and behaviours that was found to be the main cause for concern at the time of the Baseline. Students had this to say:

> *(A possible hindrance?) My superior – the superior that I report to not adhering to the overall project concept which we have been trained in... it's all about if other people have not bought into it or have a different way of doing things and they are the ones making the decisions.*
>
> Army Major 6

> *I am guessing that every IPT or team you go into will have their own idiosyncrasies and their little foibles and methodologies for doing things...so you won't be able to walk out of one IPT and apply the same principles and laws, exactly to another IPT.* Army Major 4

Specific references to the possible and adverse impact of individual and group behaviours were made based on students' past military experience, and how this might map across to the project workplace:

> *We had an SO1 come from theatre...he came a did a little road show like to find out what everyone was working on, what they foresaw coming in, really short term, 5 years max...he came to see us last...he was having to go around individual desks to find out what people were working on, give me your list of projects...that kind of thing...he felt there was all sorts of cross-purposes...it was just not swept up.* Army Major 9

> *I suppose the fact that people are still in their own little groupings – you have got dismounted close combat and mounted close combat and things like that, although there are things that cross over between the two, they are still in their own little stove pipes and may not talk to each other.*
>
> Army Major 5

> *And I don't know why, but there are certain groups in DE&S, military is one of them, and you can identify links to people who have been quite heavily involved with military from the civil service perspective....but there are some people who've been here for far too long, in my opinion, and they can't see the end state.* Army Major 8

Again, drawing on the work of Thomas and Mullaly (2008), student concerns here essentially related to their expectation of weak 'project management alignment' reflected in inconsistent and incoherent ways of working driven by conflicting behaviours and arguably, values. From the above, it can be concluded that, at the time of the Baseline, student perceptions were that *organisation alignment* and *project management alignment* were expected to be key, and on the whole, adverse influences likely to impact their own work.

Findings after 6-months and 12-months in post substantiated these concerns and pointed to the following specific barriers to the application of learning:

(i) Different approaches to doing project work,
(ii) Various levels of understanding or application of knowledge,
(iii) Conflicting and entrenched behaviours, and
(iv) Set up and Infrastructure.

RQ3b (i) Approaches to project work

Students' experience of 'different ways of working' hindering the application of learning was the most commonly stated barrier. After 6 months in the workplace, some 19% of survey responses reported 'not how the team worked' was a barrier. This figure increased to 35% of all respondents after 12 months. These results were borne out in interviews. Students were frustrated by the way in which local approaches to work obstructed their efforts to apply their learning in order to 'make a difference':

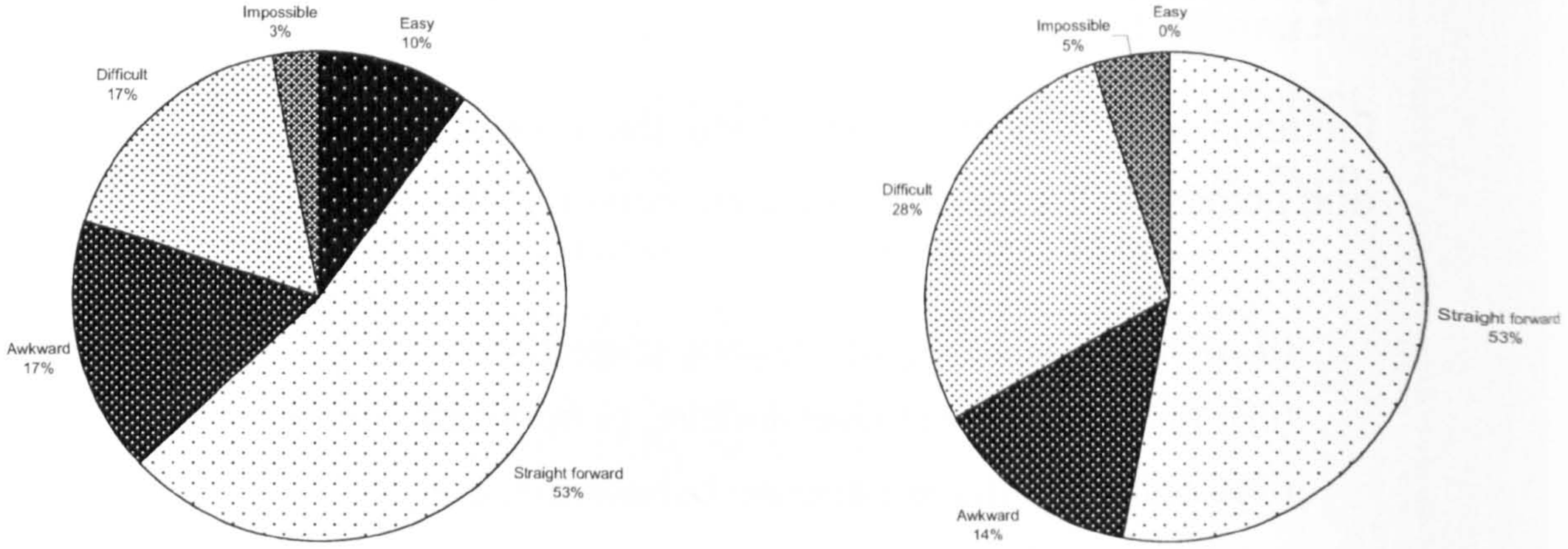
> *As much as you try and force the formal reporting procedures....you just hit brick walls by a representative at every level in the structure, civil servant, military, there is an obstacle placed there...'it's not my job' or 'it's the DEC*[91] *job' or 'DEC don't want to do it' or 'we don't want to do it.* Army Major 2

> *We are financially driven...we have people in finance to check our projects through...they're embedded within the IPT*[92] *but they are not....commercial-wise everything has to go through commercial....things can sit for a month and not move on...which is an obstacle to me...they're embedded in the team but they're not.* Army Major 8

[91] DEC: Director of Equipment Capability – the Sponsor role (now referred to as Head of Capability).
[92] IPT: Integrated Project Team – now referred to as simply, PT – Project Team.

> *We need to have equal involvement from all the DLODs*[93]*…what we can't do is have different individuals every time you have a meeting, it's got to be the same person otherwise you spend half your time re-iterating what you said last time…you need a core group of people to work on a project.*
>
> Army Major 9

The results of student experiences of applying their PM E&T in the workplace are presented in Figure 4.6.



Initial review (n=37) ***Final review (n=27)***

Figure 4.6 Experience of Applying Learning in the Workplace.

It can be seen that, over time, a small majority – 53% - of all students found it 'straight forward' to apply their learning. However, the proportion of students that found it difficult or 'impossible' increased from 20% at the time of the Initial review, to 33% at the time of the Final Review. Also, at that time (after 12 months) no students reported it to be 'easy', again, a reduction from 10% at the time of the Initial Review.

There was evidence of a clear sense of frustration around attempts to apply PM E&T learning in the workplace as the following statements from the Initial Review indicate:

> *I have often found on courses that I have done in the military before that there is a way that you learn on the course and then when you go to the job it's done differently.*
>
> Army Major 1

[93] DLODS: Defence Lines of Development being those elements that only when managed collectively will deliver up a military capability. They are Training, Equipment, Personnel, Infrastructure, Doctrine, Organisation, Information and Logistics. DE&S are responsible for the Equipment LOD, while others, including Front Line Commands, are responsible for covering the remaining DLODs.

> *I am in an IPT procuring a system not equipment. Things are very different due to local ways, the approach to procuring a system and the number of key stakeholders involved.*
>
> Army Major 20

> *The staff within DE&S[94] are certainly stuck in their ways.*
>
> Army Major 19

Again, after 12-months, students had this to say:

> *So if the guy who you are providing the deliverable for wants it in a set fashion that is not part of the tool set that we have been taught, then it is that product you are going to produce…there is a way of doing things with that particular organisation…when the boss changed over, you have to change what you do as well.*
>
> Army Major 2

> *What we were taught was not followed by the IPT Leader, as then was, causing the project to stall. He has been promoted out of that job… one hopes not to follow the Peter principle.*
>
> Army Major 23

The extent of the difficulty that students experienced in trying to apply their learning in the workplace represents a significant finding. It has already been stated (see Section RQ2d) that the influence of the team on the way students set about their project related duties reduced over time. Here, it has been found that in addition to that reducing influence, the team and specifically, local ways of working, had a major and on the whole, adverse impact on the application of learning. This finding, reflecting as it does the importance of 'community' in both applying and generating learning is consistent with the work of Lave and Wenger (1991) who make clear the distinction between "learning as internalisation" and "learning as participation" (1991: 49) and the importance of "learning as an evolving form of membership" in a community (1991: 53). The difficulties students experienced points towards a lack of 'participation' in the workplace (the absence of a community?) perhaps as a result of there being no 'invitation' to participate or alternatively, that participation was simply not an option. This is perhaps evidence of a much more fundamental issue: Human Resource Management (HRM). Huemann (2010) suggests that project-oriented companies require HR processes to be adapted and states that "even relatively mature project-based companies still struggle with inadequate HRM" with "alignments between project HR and line HR to support the project oriented company often missing" (2010: 362).

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[94] Defence Equipment and Support (DE&S) is the MOD agency for procurement of military equipment.

RQ3b (ii) Levels of Understanding

Statements made over time pointed towards there being various and different levels of understanding of PM principles and practice both within, and across, project teams. The issues found at the time of the Initial Review applied to students' own 'line management':

> *What is not easy is speaking to people who have no concept of the process of project management…and I find it frustrating when people don't. And this is not private soldiers, this is SO2s and SO1s, you've no idea, and question – do we need to somehow educate them?* Army Major 7

> *I didn't have a line manager when I joined in July. I then had a stand-in line manager for August through to October. I think it's fair to say that individual was not a strong leader as was required…he was too friendly with people. So I then instigated project management reviews.* Army Major 8

As well as to other parts of the MOD organisation:

> *It was them (HQ) just not understanding that actually there is a recognised process. It's guided by project management principles but is used by my office to run our projects, and other people do not understand the process.* Army Major 7

> *The quality of PM within DE&S is hugely variable. I have met some very bright and fiercely competent PMs but I've also met poor ones who have made decisions that have resulted in unnecessary risks being taken on operations.* Army Major 22

Again after 12-months it was found that differences in the level of understanding of PM principles persist, although by this time, some students have begun to influence their own teams to the benefit of the project:

> *The transformation to a unified procurement business is not complete and requires further management…we remain sub-optimal until we embrace a unified purpose and working practises.* Army Major 30

> *We've implemented exactly the same processes across the teams…so we're pushing for that…and the people that are leading that are people that have attended the course.* Army Major 28

> *Initially I think it was disruptive because new boy comes in….has it helped? I'm going to be bold and say yes…bottom line is we're getting there now…we've adapted what we learned.* Army Major 8

> *Approvals are a nightmare. Some elements of DE&S seem firmly embedded in the 'this is how we have always done it approach' and unaware of current policy and practice regarding project management….you end up doing project survival management.* Army Major 27

RQ3b (iii) Behaviours

It is important to note at this juncture, that whilst the PM E&T provided to the students included some reference to APM BoK elements of 'soft skills' – specifically communication, teamwork and leadership - no attempt was made to 'teach' behaviours from a theoretical stand-point. However, whilst the importance of 'soft skills' topics was not ranked highly by students at the time of the Baseline, its usefulness did increase over time – one of only two topics to do so (see Table 4.1 and Figure 4.2). That said, reference to behaviours as a potential barrier to the realisation of benefits from PM E&T was made at the time of the Baseline, and at that time was one of the students' main causes for concern.

Moreover, behaviours, and their impact on the application of learning and how work got done, continued to be a key theme over time. After 6-months in the workplace, one student had this to say:

> *I think the cultural aspect is quite important, the right behaviours, everyone has to have the same understanding, the same framework, the same focus...its going to be an individual or individuals...It's personal relationships...if people don't get on that can have a massive effect.*
>
> Army Major 4

Other students sensed and experienced barriers as a consequence of the differences between different parts of the MOD:

> *When you go across DECs, when you go cross DEC[95] audit...you really, really see stove-pipe thinking...when you're outside looking in and doing workstreams for a number of different DECs, you can certainly see quite a lot of repetition and overlap.*
>
> Army Major 10

And others between groups from the same force (e.g. Army):

> *I suppose the fact that people are still in their own little groupings – you have got dismounted close combat and mounted close combat and things like that, although there are things that cross over between the two, they are still in their own little stove pipes and may not talk to each other.*
>
> Army Major 5

As well as from across the difference forces (e.g. Army, Navy, Air Force):

> *It's not been easy applying what I've learned because I'm the new boy, I wear green[96].*
>
> Army Major 8

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[95] DEC: Director of Equipment Capability, in effect, the Sponsor or Customer organisation.

[96] Green is a traditional, colloquial reference to anything Army related. Navy is 'blue' while RAF is 'sky blue'.

And there was clear evidence of issues arising between military and civilian populations:

> *One could see military and civilian personnel sticking purely to their own stove piped processes and ways of doing things…local versions of paperwork, documentation which otherwise should be standardised.*
> Army Major 5

Overall, the research findings highlighted significant and enduring cultural issues between military and civilian populations, and between teams and some of their supporting functions - in particular finance and commercial. Further evidence of such cultural and behavioural issues was found at the time of the Final Review:

> *I think the same gap exists – too big a divide between civilian staff understanding and military expectations especially around UOR[97] work. It's sort of multi-layered…three different tiers…it becomes very laborious and adds quite a lot of cost instead of having project managers empowered.*
> Army Major 33

> *The military invest a great deal in us……..but the skills we are taught are not put fully into practise due to the environment….that being a lack of trust in the military in that we are posted for such a short period of time. Processes taught are not put into practice within DE&S and local practices take precedent.*
> Army Major 8

> *It's been practically impossible for me to apply any of my project management education and training. We have a lot of local adaptations and there is an ad hoc approach to procurement.*
> Army Major 19

> *Changing culture is a slow process. TLCM[98] and project management are permeating into my area, but slowly.*
> Army Major 18

Such behavioural and cultural issues appear to be deep-rooted within the organisation and therefore not likely to be addressed solely by 'traditional' PM E&T intervention targeted at the level of the individual. Nevertheless, the fact that these issues exist and hinder the application of PM E&T in the work place is a significant finding of the research. Price (2010) refers to the behaviours of a project regime as being the "oxygen of the regime without which little progress can be made" and argues that in a "high venture project regime, beneficial behaviours have to be nurtured as well as simply expected…through the example of the most experienced as well as learning programmes" (2010: 19).

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[97] UOR – Urgent Operational Requirement; IPT – Integrated Project Team
[98] TLCM – Through Life Capability Management.

RQ3b (iv) Set-Up and Infrastructure

A more physical barrier found was that of organisational infrastructure. Issues here ranged from the physical set up of the project team and its operating environment (e.g. office location) to the IT systems that supported the project environment. Issues associated with this particular barrier are illustrated with the following statements made by students at the time of the Initial Review:

> *Four of us worked in two different offices which led to a lack of shared processes. Information management in particular was key, because we were all running projects –what we found was that if we talked to each other we could share our experiences. By being in different offices we couldn't do that, so now we're in one office and what we do is talk to each other.*
>
> Army Major 7

> *Access to systems and when I say systems, software is included in that...what you can't do is link it to others. Microsoft project is a perfect example....I can use the software but I can't link because it's all through the web portal...you have to go through the web browser.* Army Major 8
>
> *In here about 30% of us hot desk...but using IT...you can't get in to broadband...I wasted 2 hours yesterday copying a 3 minute video clip.*
>
> Army Major 8

It could be argued that such issues are not unique to project-based organisations and may be common in other employment sectors. Moreover, whilst the extent to which such barriers apply in the context of this research is difficult to judge, it is unlikely that such issues are confined to any one area of the MOD organisation, and even less so to one particular team. This research does provide some evidence to suggest that the lack of integration of infrastructure and supporting systems is a real and potentially significant barrier to the application of PM E&T as well as learning from experience in the workplace. Furthermore, and again whilst there is no compelling evidence to suggest that it is the case here, it is often these 'tangible barriers' that attract the attention of management and subsequently the lion's share of their time and effort. We have see (Section 2.5.1 and Figure 2.1) that in his 1994 model of organisational learning, Senge argues that the "key focus for activity" is typically the triangle – notably infrastructure, methods and tools - whilst the so-called "central causality of change" – made up of awareness, sensibilities, attitudes and beliefs - is often neglected. Evidence from this research supports a similar position, with very little, if any evidence, of corporate initiatives to address behavioural change, a point that is taken up and discussed further in Chapter 5.

RQ3c: Are taught methods being used in situations where they are not appropriate?

The research is interested in understanding the benefits arising from PM E&T and the barriers to the realisation of those benefits. One other possible explanation as to why benefits from PM E&T are not realised, or where there are perceived to be barriers to the application of PM E&T is the inappropriate use of PM methods. That is to say, if a project approach is being applied and it makes no sense to apply it, or, if investment in PM E&T is being made and the nature of the work is such that it is not required, then issues will arise. The results from Initial and Final Surveys are presented in 4.7 (a) and (b) respectively below.

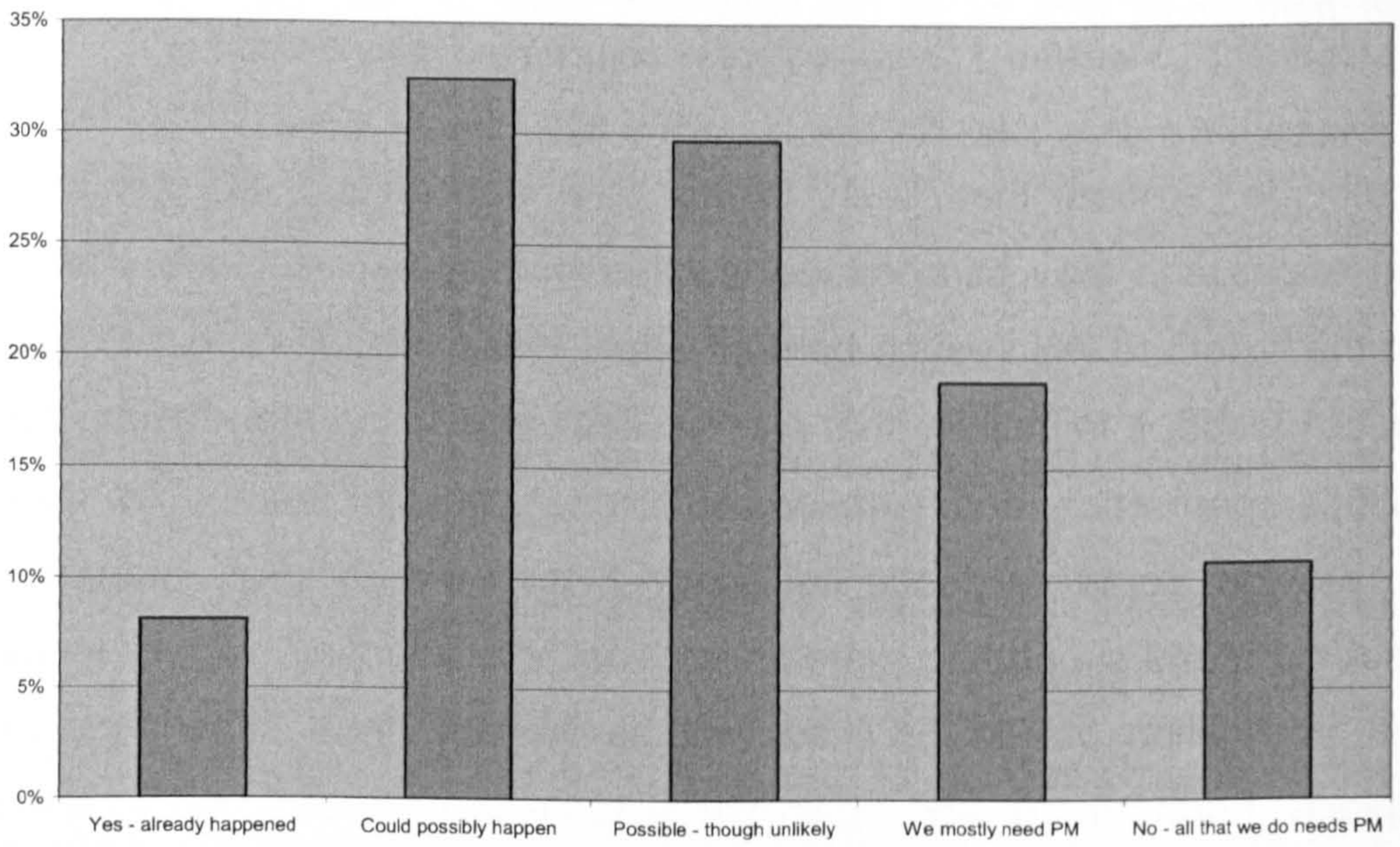

Figure 4.7(a) Is PM being used where it is not appropriate to do so?
(Initial Review, n=37)

This evidence indicates that in almost 1 in 12 situations, PM methods are being used in situations where they are believed to be inappropriate. Moreover, this statement holds over time, and in addition, the belief in the universality of PM approach at the time of the Initial Review has gone by the time of the Final Review – with a figure of 30% of students stating that PM is 'mostly' or 'always' needed reducing to just 11% after 12 months.

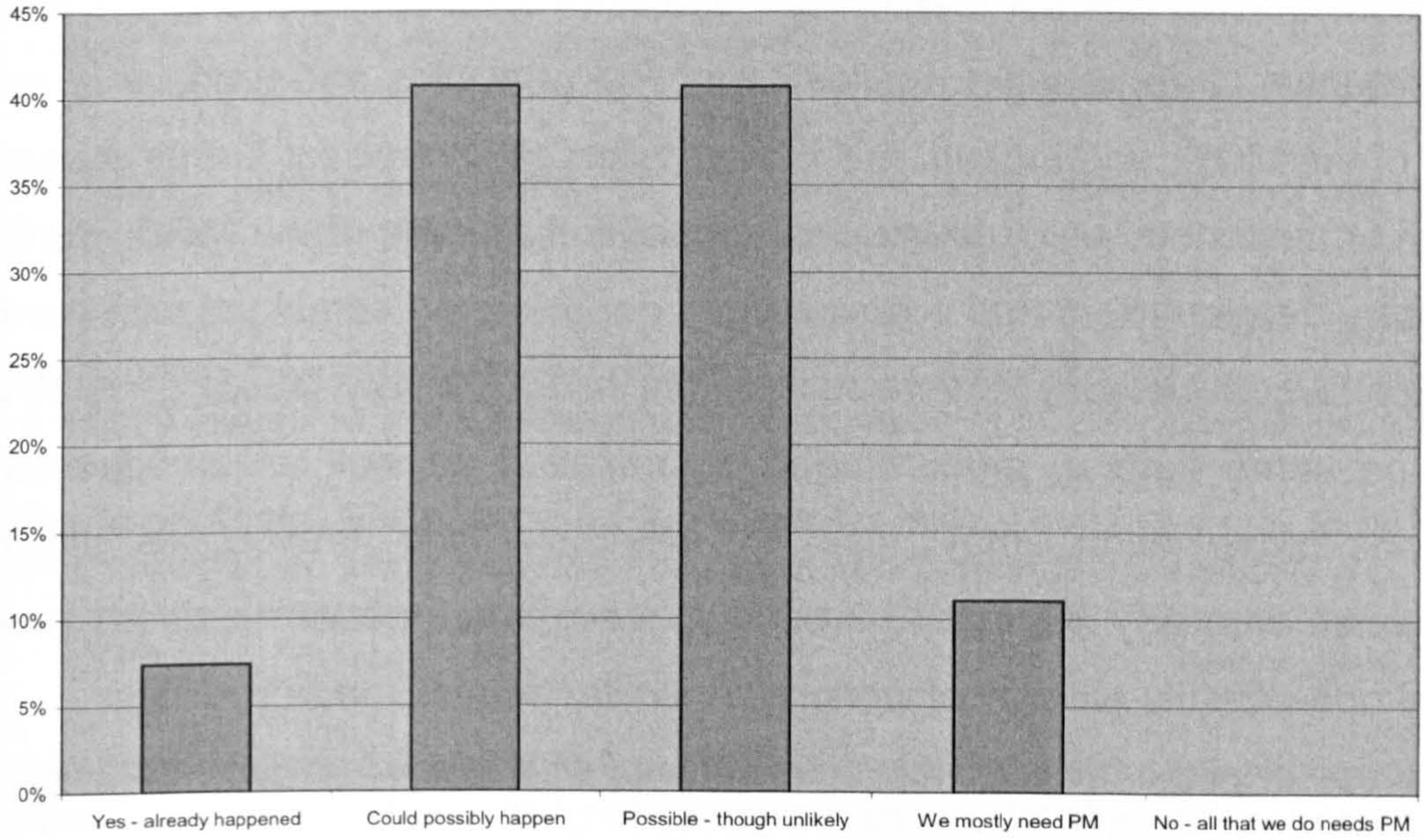

Figure 4.7(b) Is PM being used where it is not appropriate to do so?
(Final Review, n=27)

This is a key finding, and impacts on both the 'realisation of benefits' and 'contribution to barriers' findings reported earlier to the extent that benefits cannot be realised, and barriers are to be expected as a result of there being less than complete conviction that a PM approach is actually the right (i.e. a necessary) way to work. There is also evidence of this issue in a number of statements made by students, for example, where the response of PM seems disproportionate:

> *With the changes in government funded S&T[99] there is likely to be considerable upheaval within DSTL[100] particularly in the way in which it is organised and funded. There does seem to be too much project overhead cost associated with PM.*
> Army Major 2

Or where the nature of the role has changed or the nature of the work to be done does not lend itself to a PM approach:

> *I have switched jobs from that which attracted TechET. I still need to be aware of PM in MOD but less directly.*
> Army Major 20

> *I have inherited some project anomalies that were contracted several years ago and I am stuck with these legacy issues such as no URD[101].*
> Army Major 17

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[99] S&T: Science and Technology
[100] DSTL: Defence Science and Technology Limited – a government owned R&D agency that provides research advice and services to MOD and others.
[101] URD: User Requirement Document – used as a basis for defining the scope of the project.

The research falls short in identifying reasons for what appears to be the actual, and potential, inappropriate application of PM principles and process in some parts of the MOD, and indeed, this is suggested as an area for further research. However, anecdotal evidence could suggest that the role of the MOD - as both a military headquarters and a government department - combined with the fact that the largest delivery organisation within MOD, namely DE&S[102], is at one and the same time a 'procurement' organisation as well as an 'operations support' organisation, may lead to inevitable and irrevocable tensions associated with any attempt to introduce a single 'corporate business model' and a 'one-size-fits-all' way of working. A similar point is made by Price:

> *When project organisations are embedded into a business organisation the management style of the host organisation, its policies, processes and culture, frequently challenge and set hurdles for those who are managing projects. A more fruitful accommodation is urgently needed.*
>
> Price, M (2010: 10)

RQ3d: Is full use being made of the taught subjects? If not, why not?

It has already been shown (see RQ1d, Table 4.1 and Figure 4.2) that the utility of the various taught subjects varied, with some (e.g. scheduling) being rather more useful than others (e.g. estimating). Already, therefore, there is evidence to indicate that fuller use is being made of some subjects than others.

At the same time, findings presented under RQ3a, b and c have contained evidence to indicate that full use is not made of PM E&T taught subjects for a variety of reasons. It has been seen, for example, that the roles students occupy (Table 3.2), local ways of working (Figure 4.5) and a range of barriers in the workplace itself (RQ3a) as well as the appropriateness of PM methods in certain situations (Figure 4.7) all contribute in one way or another to less than full use being made of the taught subjects. Further evidence can be found in student statements of additional contributory factors which, together with previous findings, reduce further the apparent use made of the taught subjects. The following statements highlight a number of these issues:

[102] It is important to note that DE&S was only formed in April 2007 from the merger of two previous separate and distinct organisations: Defence Procurement Agency and Defence Logistics Organisation. Some might argue that the nature of these respective businesses does not lend itself to a single, and common way of working.

Concurrent work seems to be impossible, cautiousness in the workplace means everyone is asked to comment and hence work on everything.
Army Major 17

It's partly due to leadership, to that person being able to deal with confrontation when people aren't pulling their weight.
Army Major 33

Surrounded by people with little urgency, little understanding of the process and little interest at times as they can't be sacked. Army Major 20

Barriers: Apathy and change fatigue within the team…most unhappy to be challenged in working procedure and over reliance on industry skill sets (i.e. estimating, scheduling)…and the bare fact that there is not enough cash.
Army Major 3

It is great to have a framework but it isn't always practical to apply it due to time constraints made worse by steamlining within the organisation.
Army Major 11

These statements point towards issues at an organisational rather than a team or individual level – corporate policy, terms of employment, strategic change and so on. These factors represent additional barriers to the realisation of benefits from PM E&T since together they create an environment which is neither conducive nor welcoming to new comers (i.e. the students) applying their learning.

RQ3: Barriers to the realisation of benefits from PM E&T: Summary

It is not an explicit aim of this research, nor within the scope of its data collection and analysis, to determine that application of PM processes will result, or indeed has resulted in improved project outcomes. Whilst further research in this area would help (see Chapter 6), a fundamental assumption made is that adoption of PM principles is, in and of itself, a 'Good Thing' given that PM now forms a key part of the MOD Competence Framework. What is of interest and relevance to this research is the nature of the benefits of PM E&T, the extent to which such benefits are realised in the workplace, and the barriers that hinder their realisation. The research has identified a number of such barriers and whilst perceptions of the workplace and issues anticipated around organisation structures, roles, behaviours and ways of working, were substantiated in findings over time, further specific barriers identified were:

- Approaches to project work and local working practices
- Different levels of understanding of PM principles in and across teams
- Counter-productive behaviours and 'cultural' influences, and
- Infrastructure.

In addition, there is evidence that in some situations, taught methods were being used where there was less than complete conviction that it was the most appropriate way of working. These findings would suggest that barriers to the realisation of benefits from learning involve, and cut cross all elements of competence, defined here as[103] '*an underlying characteristic of an individual that is causally related to criterion-referenced and/or superior performance in a job or situation*' and not simply knowledge and skill elements. The key barriers identified *impact* at the level of the individual[104] but are created, not solely at the level of the individual, but at higher levels, associated with the team, the community or indeed, the wider organisation.

Such barriers are therefore associated with, and more closely related to, the contextual and environmental factors beyond the direct influence of (especially relatively junior) individuals. This observation is discussed further in Chapter 5, and links established to, for example, the apparent low influence of Team Leaders and Sponsors (as senior managers) and the perceived lack of a real, coherent and managed 'community of practice' across all parts of the MOD.

RQ4: What can MOD do to improve its return on investment from PM E&T

RQ4a: What changes could be made to the content of PM E&T?

Earlier findings have demonstrated both the benefits of, and barriers to, the application of learning arising from PM E&T. Though not a primary objective of the research, part of its rationale (see Section 1.2) was to provide an improved evidence based understanding of such benefits and barriers, in order to contribute to the design and development of future people development

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[103] Spencer and Spencer, 1993.

[104] Whilst the research has not found evidence of barriers at the level of the individual, it seems unreasonable to claim that there are, or will be no such barriers. A rather fundamental explanation of this lack of evidence may be simply be due to the survey response rate and voluntary interview approach, reflected in coverage and non-response errors. See Section 3.5.2.

initiatives. To that end, students were invited to comment on changes which they felt could, or should, be made to the content of their PM E&T in order to improve its usefulness or effectiveness. Findings relating to 'gaps' in the PM E&T have already been presented (see Section RQ1e) and it has also been established that the relevance of a student's PM E&T varies according to the individual's background and role (see Section RB1b and RQ2b). This question was therefore aimed at 'sweeping up' any additional, peripheral issues that could be addressed through changes to the content of PM E&T.

Qualitative evidence of the nature and need for such changes is relatively limited. Reference was made, for example, to the need to 'ground' PM E&T in the 'reality 'of the workplace:

> *During TechET the priority was project work. I am in an IPT who have a CAT A programme....therefore a wider perspective on programme management and the wider initiatives within MOD and acquisition would help me more....not just an introduction.* Army Major 30

And to ensure the currency of the taught materials in the context of Defence:

> *I think a better understanding of the MOD Unified Customer and more understanding of its constituent parts – particularly business case approvals is needed.* Army Major 2

There was also support to retain and maintain academic content through the use, not of a course as such, but, as this statement makes clear, of more community based approach to learning:

> *I think we need to ensure that all project managers are aware of the current academic thought processes and a simple thing to me would be to have a series of seminars at the beginning of the financial year which identifies the new way forward.* Army Major 8

The potential for a more structured approach to establishing and maintaining a more explicit and effective 'community of practice' in response to some of these findings has already been identified and will be discussed further in Chapter 5. The findings of this research are also consistent with those of Cooke-Davies (2010) and Pellerin (2009) who report independently on the benefits of greater investment in team based initiatives aimed at broader organisational development to support improved project performance – a point also taken up later in Chapter 5.

RQ4b: Is the focus on the individual alone sufficient or are there other targets?

The subject PM E&T for this research was class-room based at the level of the individual. However, the research was interested to explore student views on additional, alternative approaches to perhaps involving different groups and aimed at different levels of the organisation. A key finding was the apparent difference in level of PM 'maturity' across different parts of the MOD, which in turn, impacted cross organisational working. Both the Sponsor (DEC) as well as the User (Front Line Command) organisations are involved:

> *Cross DEC working is an issue..... DECS work in isolation of each other. People in Front Line Command work in stove pipes....parts of the same organisation could be working on similar projects without people knowing.*
> Army Major 2

> *I work for RP Centre directly and have visibility of the FLC and DE&S.... FLCs just don't understand their own environment or care to do so...their poor planning entails visibility out to only 3 months rather than 10 years...we remain sub-optimal until we embrace a unified approach and working practices.*
> Army Major 30

And it is not just military personnel. The need extends to civil servants and other functions such as finance and commercial that would not normally be required (even expected) to undertake PM E&T even though what they do, and how they do it is critical to project success:

> *We fail to constantly educate...it's not in any way a dig at the civil service...but we fail to educate them properly....they are mandated to do 6+4 training days a year and some people have had those for as long as I've been alive...and they've never done a significant course like I have..... go out there now and speak to anyone in the team and ask the question, 'what is the biggest obstruction to you delivering this project today?' they will say finance or commercial, because we don't integrate them into the projects early enough. Project finance officers sit downstairs, work on their own timings and do their own thing.*
> Army Major 8

There is evidence also of a 'community' beginning to emerge at the level of the students as a result of their PM E&T as the following statement indicates:

> *To put it bluntly, it is evident from my experience, and the anecdotal experience of my peer group on the course, that it is obvious when someone in the Tech area has not done this course....Across the SO2 community[105] that I deal with, the common experience of the training has been an enabler in how we get things done.*
> Army Major 23

[105] The use of the term 'SO2 community' here is an interesting one. We shall return to this point in Chapter 5.

However, findings elsewhere would suggest that both more junior and more senior ranks would benefit from some level of PM E&T in order to ensure consistency of understanding 'up and down' the organisation as the following statements suggest:

> *There is not enough understanding of Project Management and there is insufficient detail in place in plans and as a consequence many (projects) over run.*
> Army Major 19

> *It should start earlier. Captains (and sometimes even junior) are working in a similar environment as SO3s and would benefit from much of the course content.*
> Army Major 5

> *Common working practices across DE&S that are independent of the product makes moving between posts much easier and allows staff to be more effective quicker.*
> Army Major 17

And there are some that go further:

> *Project management should become an integral part of our processes that is understood by all to some degree – not just those who practice it. This will ensure that everyone understands the issues and outputs.*
> Army Major 28

Put simply:

> *Not all personnel have the same education and training. PM is becoming more widely recognised and used....but the process is not pan-Army and so the results and benefits are patchy. More personnel must be trained.*
> Army Major 34

RQ4c: Is there the right balance across different elements of competence?

Definitions of 'competence' have been presented earlier (see Section 2.3.3) and the characteristics of competence (Spencer and Spencer, 1993: 116) outlined. Clearly, the principal emphasis of PM E&T was 'knowledge' and 'skill' elements and the research was as a result, mainly focussed on those elements. Findings relating to PM Knowledge and Skill as being a key benefit of PM E&T have been presented earlier (see Section RQ2c (iii)).

Findings relating to behaviours[106] have also been presented (see Section RQ3a) and the point made that 'behaviours' constituted a key barrier to the realisation of benefits from PM E&T.

Evidence relating to other elements of competence – i.e. 'traits' and 'motives' – is hard to find in line with views of Alam, Gale and colleagues that these

[106] Behaviours are very closely related with the competence element 'self-concept' - defined by Spencer as "a person's attitudes, values or self-image" (1993: 116).

elements are "more hidden", "deeper" and "central to personality" and therefore much harder to develop using traditional taught methods (2008: 230). However, evidence can be found relating to, for example, apparent shortcomings in how people are motivated both in their job related tasks:

> *We have to reward success in a positive ... and that goes across the board from the smallest element...it could be a letter of well done, a pat on the back...I don't think we as a team here reward success. We never actually say to him Well Done.* Army Major 8

And in respect of the need for, and benefits of, continuous personal development:

> *Education, the further development of individuals.....but willingness is missing...it's not as if they have to go far...only to a building next door...so that's been a barrier....other peoples' willingness to undergo further training.* Army Major 8

And with regards to promotion policy:

> *I think a lot of people get frustrated and b****** off out of the army and go and work for contractors....but we need intellectual soldiers as well as brave ones.... the intellectual soldier...he's the one sitting back not giving the presentation...the ones who give the presentation have no depth and substance...the intellectual element is not always recognised.* Army Major 2

There is also evidence of issues relating to the quality of management and leadership:

> *The only barriers...at the really senior level....the way they work...the decision making process rather than the old way of evidence and report sign off...seems to be an extra step, slows the whole thing down.*
> Army Major 28

> *Chain of Command needs to impose qualifications for working in PM and use established standards and documents for corporate work.*
> Army Major 29

Including for example, the management of non performing staff and the issues associated with a corporate environment that hinders prompt and effective treatment of poor performance:

> *One of the major barriers is the ability for team leaders to spot and deal with people who aren't pulling their weight....getting to remain in post. It's partly due to leadership, and being able to deal with confrontation, but it's also the process you need to go through to give people warnings, hoops they have to jump through...all the rules and regulations.* Army Major 33

Finally, and though not a competence issue in and of itself, the question of continuity of staff – referred to as 'churn' - in being a key enabler to striking the

right balance across different competence elements was found to be important as the following statements indicate:

> *The turnover of military staff (every 2 years) causes a lack of continuity and a loss of knowledge…you haven't got the background to earlier decisions.*
>
> Army Major 4

> *The other barrier is the turnover of military staff. The result is a loss of knowledge, because our projects go on for 5 or 6 years…a military person will just get 2 years exposure…that missing knowledge could cause, does cause (issues) down the line…we need to stabilise the teams.*
>
> Army Major 33

> *I can think of a wealth of examples where people get trained and then they move and don't use it…you end up paying people to re-train…you're putting all this investment up front and all the benefit is lost or diluted*
>
> Army Major 2

> *Staff turnover doesn't help, because at least in the first few months, you're only as good as your handover, and maybe that's one thing I would say is an issue – (job gapped) - they had put a contractor in but he didn't get involved and things have since surfaced that I wasn't really aware of, or didn't realise it was my responsibility*
>
> Army Major 9

> *There is a perception that the trained military individuals come in with new ideas and add grit to the day to day running of projects, the opposite is the case and we are trying to remove the grit. Military individuals in key project management posts should be posted for more than 2 years.*
>
> Army Major 8

Put another way, people changing roles too frequently was found to result in disruption of the team, loss of 'value-added' from PM E&T and potentially misaligned motives driving short term thinking and decision making.

Heumann (2010: 363) has reported that project oriented companies require adapted Human Resource (HR) processes such as recruiting, appraising and rewarding and specific HR Management (HRM) processes such as assigning, developing and dispersing. The extent to which MOD has aligned its HR processes – both adapted and specific - to a project orientation is not within the scope of this research but evidence suggests that there is still some way to go to if that is considered to be strategic imperative and an enabler of improved performance.

RQ4d: Should there be more investment by MOD into PM E&T?

> *Those individuals who are correctly trained deliver significantly better outputs. For those who are not trained we (MOD) spend a significant amount of time and money on rectifying issues that arise.* Army Major 8

This quote would suggest that there is an economic case for investment in PM E&T. However, it was not only the level of investment that some students felt was important – but also the way in which that investment was made. Investment "needs to be directed at the right posts" and whilst "we do enough time wise" "we need to identify better what should be done". After 6 months in post, 51% of students believed that MOD 'don't do enough and should do more' whilst 8% stated that 'too much time is spent on PM E&T' (See Figure 4.8 (a)).

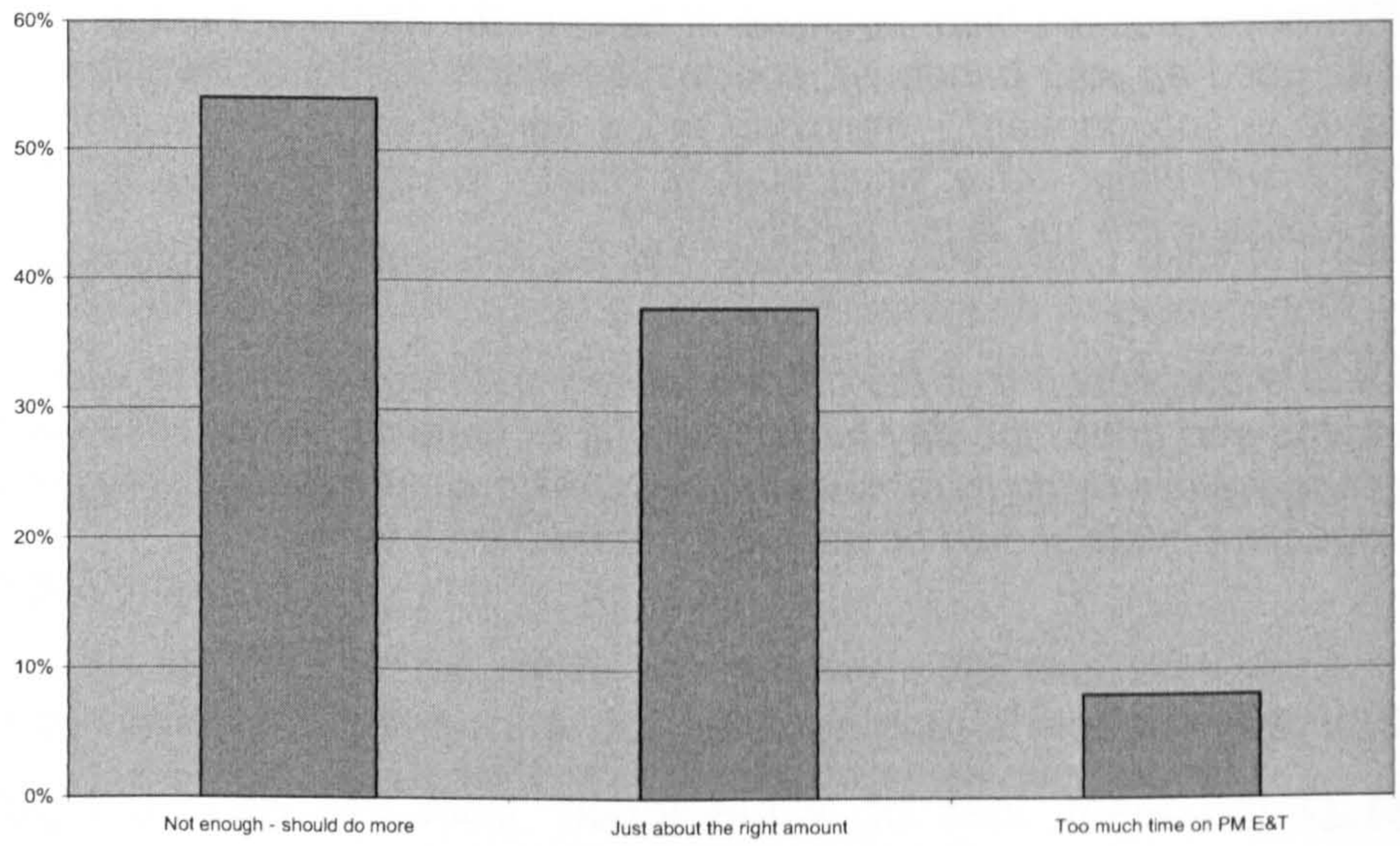

Figure 4.8(a) Does MOD invest enough in PM E&T? ***(Initial Review, n=37)***

This general picture was also reflected in findings relating to the level of interest in PM E&T. At the time of the Baseline, 72% of students were either 'very interested' or 'interested' and 'would happily do more' PM E&T. A further 16% were 'interested' and 'would do more if the job needed it'. Only 12% of all students were found to be 'not really interested' in learning more about PM. However, after 6 months in post, only 36% of students had actually undertaken further PM E&T the vast majority of which (>90%) were 'specialist' courses (e.g. Requirements Management, Business Case & Approvals, Risk Management).

By the time of the Final Review, there was a reduction in the number of students who believed 'not enough' was done (from 54% to 44%) and a commensurate increase in the number who thought too much time was spent on PM E&T (from 8% to 11%) as shown in Figure 4.8 (b) below.

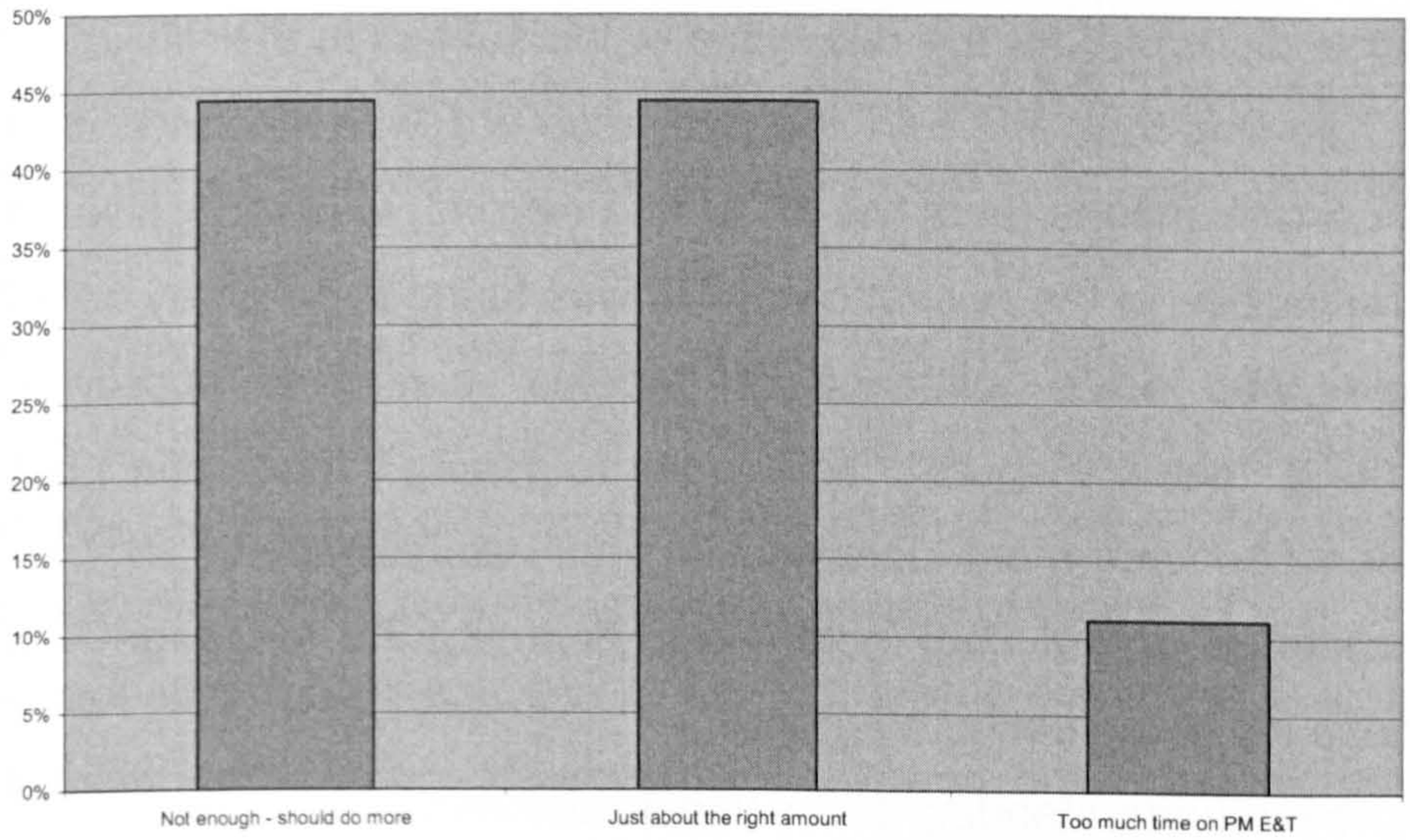

Figure 4.8(b) Does MOD invest enough in PM E&T? *(Final Review, n=27)*

Moreover, at the time of the Final Review, only 18% of students had undertaken any further PM related training. These courses were generally of a more PM specific nature, such as PRINCE2, APMP and APM-PQ. At the same time, after a full 12 months in post, a majority - 61% - of students had not received any further PM related training and were of the opinion that no further PM E&T was needed – a figure broadly in line with the result obtained in relation to the question of further investment in PM E&T.

These results would suggest that students' initial interest in further PM related development is tempered as they join and then set to work in project roles, and perhaps as they go on to discover that the demands of their day to day challenges cannot be met in part, if at all, by the PM training options available to them. Put another way, the motivation to undergo further PM E&T is reduced by the relevance of those interventions given the nature of the workplace. Here again, HRM policy and practice must take into consideration the specific demands of a project oriented environment (Heumann, 2010).

4.3 Chapter Four ~ Research Findings: *Summary*

Findings of the research have been presented under the four key headings that reflect the main Research Questions. In brief, it has been found that students arrived at the start of their PM E&T with a low level of familiarity and arguably a fair degree of disregard for the relevance of the subject to their military careers. However, following their PM E&T the relevance of PM to students' careers and associated organisations (both the MOD and beyond) was recognised and over time this realisation of the relevance of PM was found to be a key benefit of PM E&T. There was some evidence of benefits relating to improved project outcomes (e.g. "better outputs", "an enabler to getting things done") but the key benefits identified were more 'upstream' in their nature, namely:

- Knowledge of PM Terminology and 'learning the language' – a benefit whose value increased over time;
- Improved understanding of the wider business context, and
- Knowledge and skill in applying PM principles, tools and techniques in a wide variety of roles and situations.

It was also found that whilst PM E&T was an important influence in shaping students' approach to work, it was not the main influence. The most significant and resilient influence over time was, perhaps not surprisingly, students' own military experience.

Four key barriers to the realisation of benefits were identified, namely:

- Different approaches to project work and local ways of working;
- Different levels of understanding across the team and wider organisation;
- Behaviours, and
- Set-up and Infrastructure.

Brief reference to the literature and previous research findings has been made as and when appropriate, either to support the findings of this research or to provide a contrasting perspective. These links will be developed and discussed further in Chapter 5. Meanwhile, a complete list of all the 26 key findings is given below for ease of reference.

It is important to note that these findings should be interpreted in the light of study limitations as outlined in Chapter 3 and discussed further in Chapter 6.

RF1. Students entered their PM E&T with a low level of familiarity with both the PM discipline and what the term 'project management' actually means.

RF2. A majority (55%) of students had no prior PM E&T. Those with the most experience and knowledge were generally from technical regiments.

RF3. Students' views on the relevance of PM to their careers changed significantly, and positively, as a result of their PM E&T.

RF4. PM was believed to be useful to students' own careers by a majority of students (>80%) and this remained the case over time. The relevance of PM to students' own careers was a key benefit of their E&T.

RF5. PM proved to be of less use to student teams over time than had been their initial expectation. However, the utility to organisations beyond the MOD was high and remained high.

RF6. All taught PM subjects were found to be of some use. However some topics (e.g. scheduling) were more useful than others (e.g. estimating).

RF7. The trend for the utility of PM topics over time was downwards, with the exception of PM Terminology and Soft Skills where utility increased.

RF8. Gaps in PM E&T were found to exist, and these related in the main to job specific skills and the need for greater coverage of MOD context.

RF9. Students' PM E&T led to a number of beneficial changes, but these were found to be overwhelmingly at the level of the individual student. There were very few changes at the level of the team or organisation.

RF10. An immediate benefit of PM E&T was the opportunity to 'learn the language' resulting in improved communication and student contribution.

RF11. Greater appreciation of the 'bigger picture' was a further key benefit, enabling students' to contextualise their learning within defence.

RF12. The final benefit identified related to the ability to apply PM tools and techniques and greater clarity and confidence with the project approach.

RF13. The influence of the team on the way students worked was initially high, but reduced over time. The influence of PM E&T increased over time with students' own experience remaining the greatest influence. Senior

managers (Team Leaders, Sponsors) appeared to exercise little influence over the way students worked.

RF14. Student perceptions of the likely barriers they would experience in the application of their learning formed two key themes: unclear organisational structures and poor cross organisational working driven by behaviours.

RF15. Students' perceptions of likely barriers were later confirmed. Students were not surprised but frustrated with what they found in the workplace.

RF16. Over time, there was a slight increase in the extent to which students could directly apply PM E&T in the workplace, but after 12 months, a majority (55%) were still not able to apply all or most of their learning.

RF17. The main barrier to the realisation of benefits from PM E&T was found to be the different approaches to doing project work and local work practices.

RF18. A further and significant barrier was found to be different levels of understanding of PM principles and practice both within, and across teams and functions. This issue also transcended levels of the organisation, involving both more senior and more junior ranks and personnel.

RF19. Behaviours in the workplace, and the existence of 'multiple cultures' driving colloquial thinking, decision making and actions were found to be major barriers to the realisation of benefits from PM E&T.

RF20. The final barrier was found to be infrastructure, including accommodation and IT systems and the 'connectivity' of teams' hardware and software.

RF21. Some students (<10%) believed that PM methods were being used in a situations were they were not believed to be appropriate. A higher figure (40%) consistently believed over time that this could possibly happen.

RF22. There appears to be different levels of maturity with regards to PM knowledge and practice across different parts of the MOD. The Sponsor organisation and FLCs appear to have lower levels of maturity than DE&S.

RF23. There is evidence of a 'community' emerging at SO2 level.

RF24. There is no evidence of the development of 'trait' and 'motive' elements of competence. There are, however, indications of shortcomings in how people are motivated, managed and led.

RF25. Continuity of staff was believed to be important. However, the MOD system drives high staff turnover and such 'churn' was found to be

disruptive, to reduce value-add from E&T and to drive short term thinking and decision making.

RF26. Students generally believed that MOD does not invest enough in PM E&T and should do more. However, motivation to undergo further PM E&T is reduced over time by the nature of the workplace.

The next chapter, Chapter 5, will discuss these findings in light of the work of others and specifically, the findings from the literature presented in Chapter 2.

"Leading projects will become the way one develops as a general manager. Over time, the ranks of the senior executives will be filled by people capable of integrative leadership with a rich background of getting things done through projects".

(Bowen, Clark et al. 1994)

"Men have an extraordinarily erroneous opinion of their position in nature: and the error is ineradicable".

(W. Somerset Maugham 1874 – 1965)

CHAPTER FIVE

DISCUSSION

5.1 Introduction

The review of the literature in Chapter 2 and the research findings presented in Chapter 4 provide us with a basis for the discussion that follows. The Chapter adopts a simple structure that essentially reflects the two main areas of the literature explored, namely Project Management Education and Training (and specifically commentary on current approaches to PM E&T) and Learning in the Workplace. For each of these headings, the relevant Research Findings (RF1 – RF26) are referenced and discussed against a backdrop provided by the literature.

5.2 Project Management Education and Training

There are clear concerns in the literature regarding the very nature of traditional project management development courses. Many academics and thoughtful practitioners argue that the current approach to education and training has been too pre-occupied with 'training to standards' with too great a focus on the 'what' of project management producing 'trained technicians' rather than the 'how' and the creation of 'reflective learners' (Crawford 2000, 2006; Smith and Winter 2005; Thomas and Mengel 2008). There is a need, others argue, for a shift of mind set away from 'left brain' towards 'right brain', with less emphasis on PM tools and techniques and a greater emphasis on attitudes, behaviours, communication and 'craft knowledge' (Winter and Smith 2006; Hartman 2008).

Moreover, the traditional approach focusing as it does at the level of the individual, is believed by others (Pappas 2005; Berggren and Soderland 2008; Bredillet 2008) to be too narrow and too shallow, and so does not allow the effective transition and application of learning as part of a wider, team-based approach to learning in the context of broader organisational development.

In contrast to these schools of thought, this research has found a high level of appreciation for what was in many ways a relatively traditional course of PM E&T (RF3). That said, the students that formed the data set for this research were generally unfamiliar and inexperienced with the PM discipline (RF1, RF2). It is therefore important to view this early benefit of PM E&T from the perspective of a 'first things first' approach to the development of project people. Nevertheless, the realisation of the relevance of project management to students' own careers provided an impetus and a momentum over time for interest and learning in the discipline (RF4). It is also worth noting at this juncture, that the findings also indicated a high level of interest in PM as a result of students' longer term career plans given the utility of the discipline to organisations beyond the MOD (RF5).

Although lacking PM experience, the students were nevertheless bright (masters level), able (company commander) and militarily speaking, well experienced Army officers. Across this population, there was a high level of appreciation for the benefits arising from their PM E&T, and in particular, the opportunity to become fluent in the language[107] of project management (RF10) and the ability to be able to apply fundamental tools and techniques based on an understanding of key PM principles (RF12). All taught PM topics were found to be useful to some degree with 'technical' topics (Scheduling, Risk Management) proving particularly useful (RF6). To that extent, the research has shown that an initial emphasis on developing the 'trained technician' and the adoption of a 'hard paradigm' to develop what Pellerin (2009) refers to as 'core skills' brings real benefits to 'apprentice' practitioners that have a relatively low level of prior knowledge and experience of the discipline.

[107] Lave and Wenger (1991) draw the distinction between 'talking about' and 'talking within' a practice, in the context of Community of Practice, a topic we return to in Section 5.3.

However, with the exception of PM terminology and Soft Skills, the general trend for the utility of taught PM topics over time was downwards (RF7). Stacey (1996) makes clear the limitations of mental models in dynamic situations and the shortcomings associated with 'single loop' learning when circumstances change and original assumptions made are no longer applicable. This downwards trend could be evidence, therefore, of the diminishing utility of the 'mental models' taught – the limitations of what Bredillet (2008) refers to as a 'technicist' approach to project management. Cooke-Davis (2010) suggests that there has perhaps been too much emphasis on "linear, rational and deterministic approaches, and insufficient attention paid to the complexity of interactions of irrational human beings in organisations" (2010: 8). Whilst high at the outset (when the novelty of the methods is uppermost in students' minds), the reduction in utility over time may be a consequence of students' experience in the workplace and their realisation of the shortcomings and limitations of these models in situations that are not linear and perhaps not even rational.

Carbone (2004) argues that class-room based learning has its limitations and is incomplete without a degree of workplace context and an 'experiential dimension' - and this view was substantiated in the findings (RF8). In commenting on the gaps in their PM E&T, and the improvements that could be made to its content, students made clear the need for taught topics to be 'grounded' in the workplace and for the content and context of the PM E&T to better reflect the complexity of the project environment. Pellerin (2009) argues that "team performance research indicates context is the driver of team performance 80% of the time" (2009: 4).

The lack of 'reality' associated with the class-room approach was reflected in further findings in connection with, for example, the variable nature of PM 'maturity' across the MOD (RF22) and in presenting PM as a 'one size fits all approach' when, in reality, such an approach may not be the most appropriate one to adopt (RF21) given the complexity of the defence projects' business and the diverse nature of MOD activity. Preparing students for a complex, dynamic work environment, therefore, cannot be undertaken solely through the use of class room based interventions aimed at the level of the individual student.

Pollack (2006) makes clear the need for 'facilitated exploration of learning' in the workplace whilst Stacey (2003) describes the important contribution of 'group practice' to both knowledge creation and ultimately group performance. In the same way Berggren and Sodurland (2008) refer to the opportunity for (and importance of) 'socialisation of learning' whilst Bredillet (2008) makes clear the need for teams involved in solving a 'unique conundrum' to be able to draw on both past and emergent knowledge. Pellerin (2009) goes further and argues that "individual training, once people have core skills, is essentially useless" (2009: 4) whilst Cooke-Davis (2010) presents evidence that supports the need for team-based training as part of a wider organisational development programme with learning outcomes linked to key performance indicators.

These views make clear the shortcomings and inadequacies of a class-room based approach to the education and training of project people. The research provides evidence, on the one hand, of the benefits from such an approach in establishing a 'baseline' of knowledge and understanding (RF12), and in providing 'apprentice' practitioners with the opportunity to 'talk about' PM practice (RF10) whilst on the other, exposing the pedagogical shortcomings (RF5), gaps (RF8) and the variable utility of topics over time (RF6, RF7).

5.3 Learning in the Workplace

The limitations of class-room based learning have been described above, leading to a recognition and acknowledgement of the need for a broader, and altogether more strategic approach to learning in the work place. In a similar vein, whilst the research did reveal corporate policy that required a fixed number of 'training days' to be undertaken by individuals[108], the research found very little evidence of systematic and structured workplace learning. Moreover, Line Managers and Team Leaders do not appear to consider themselves responsible for enabling, implementing or facilitating such learning[109].

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[108] For example, DE&S requires individuals to undertake '6+4' days of training in any one year – either of a general or job specific nature. Moreover, people's own personal development is left to the individual to design and manage.

[109] It the author's own understanding that MOD / DE&S policy is for individuals to take responsibility for their own personal development.

The research has found, however, that many of the issues associated with realising the benefits from investment in class-room based PM E&T are rooted in the experience that students subsequently have in the workplace. Put another way, benefits from PM E&T exist, but only to a point as a result of factors beyond the control and influence of the individual acting out a role on a relatively foreign and lonely stage, the workplace, with a rather hostile 'stakeholder' audience and a script that is different to that of other players[110].

One such barrier preventing the realisation of benefits from PM E&T was found to be behaviours – shaped by attitudes and values - and giving rise to various 'cultures' in the workplace that conspired to hinder or block the application of learning from students' PM E&T (RF19). In fact, even at the time of the Baseline, students pointed to 'behaviours' as a key potential barrier and to that end, this might have been considered a 'known' barrier even prior to students entering the work place[111] (RF14). Curiously, at the time of Baseline, the utility of 'soft skills' was not ranked highly by students. However, and importantly, the utility of 'soft skills' was one of only two topics (the other being PM Terminology) whose utility increased slightly over time – from a mean of 2.67 at Baseline, to 2.78 after 12-months, suggesting a greater appreciation of the importance of such a skill set as people worked in post.

Pollack (2006) alludes to the importance of behaviours in referring to the need for greater consideration of the 'soft paradigm' in the development of project people. Pollack emphasises participation and the "facilitated exploration of projects" (2006: 267) where the role of a project manager moves from the traditional position of 'expert' to one more closely aligned to 'facilitator' – requiring a commensurate change in behaviour.

[110] The acting analogy here draws upon the work of Bredillet (2008) who uses the same construct in the context of 'coping' being a combination of 'learning and acting'.
[111] The fact that this barrier was identified by students as a potential hindrance even before they entered the workplace, suggests that this was a well known, and to-be expected issue, and one therefore that might have been addressed as part of their education and preparation for the workplace.

Hartman (2008) makes a related point in exposing shortcomings in traditional BoK[112] approaches to defining the PM domain and concludes again, that "the primary missing ingredients have more to do with behaviours and the human condition than strictly with traditional project performance metrics" (2008: 264). The importance of appropriate behaviours in shaping what Thomas and Mullaly (2008) refer to as a 'project management culture' is clearly fundamental. However, whilst further education on the behavioural aspects of change would be a useful addition to PM E&T, actually changing behaviours is not within the domain of individual and relatively junior project people. It requires a team or community effort, appropriately led and suitably reinforced as implied by Stacey (2001).

Senge (1994) brings into focus, through his 'triangle and circle model' (see Figure 2.1) the interplay between tangible aspects of learning on the one hand (tools, methods) and the intangible concepts on the other (attitudes, motives, beliefs). Senge makes the point that it is the circle articulating the intangibles that represents the "central causality of change", and yet it is all too often the 'triangle of tangibles' that receives the most management attention. A pre-occupation with the 'tangible' and a failure to address the 'intangible', Senge argues, risks producing the wrong kind of change, at the wrong level and in an unsustainable way. Based on the findings of this research, it could be argued that not enough attention is being paid to the central causality of change within MOD and that too much attention is being paid to the tangibles. There is certainly evidence in the research that MOD investment in PM E&T, whilst effective at one level, the individual, is arguably failing to deliver the changes that are required for improved community practice and corporate performance, pointing towards the need for a different approach to overcoming barriers associated with behaviours and ways of working in the workplace.

This is a key point, and potentially brings into play a whole new literature – namely that of change management. Crawford and Nahmias (2010) make a

[112] Interestingly enough, the term 'Bodies of Knowledge' appears in the work of Wenger and McDermott (2002) in connection with their views on the 'nature of knowing'. Here they make the point that such Bodies of Knowledge are "developed through a process of communal involvement" (see Secction 2.5.4).

useful comparison of the project and change management competencies across the roles of Project Manager and Change Manager (2010: 407). Whilst there were some similarities (Leadership, Stakeholder Management, Decision Making) there were also some notable differences as Table 5.1 indicates[113].

Project Manager	Change Manager
Organisation structure	Creativity and challenge
Project definition	Coaching skills
Admin, reporting, documentation	Facilitation skills
Transition management	Presentation skills
Change Control	Process design
Closing	Learning and development

Table 5.1 Project and change management competences (Source: Crawford et al (2010))

It is beyond the scope of this research to explore further the change literature but this point picked up later in Chapter 6 in the context of recommendations.

A further barrier to the realisation of benefits from PM E&T was found to be the different ways of doing project work and the local practices in the workplace that frustrated the application of the taught methods, tools and techniques (RF17). Even after 12-months in the workplace, 56% of students still found that they were unable to apply most of their learning (RF16). The difficulties of realising benefits from PM E&T were further compounded by an additional barrier in the form of different levels of understanding of PM principles and processes across teams, functions and the wider organisation (RF18). These barriers affecting the realisation of benefits from MOD investment in PM E&T – behaviours (RF19) local ways of working (RF17) and different levels of understanding (RF18) – are all characteristics or consequences of the workplace itself. This therefore brings into play the need to consider more carefully the nature of organisational learning and the contribution to learning that could be made by the workplace itself. Here the players comprise senior management, the 'project team' and the wider project 'community' acting with a common script that reflects the importance of consistency and coherence across all 'levels of organisation'.

[113] These aspects of competency were identified by comparing the findings of a number of research based studies. Crawford describes it as a 'literature based comparison'. Crawford and Nahmias (2010: 407).

Eraut (2006, 2007) makes clear the importance of the workplace to learning and his research concluded that "the majority of learning was from informal learning within the workplace itself" (2007: 408). Despite resembling a project-centric workplace, where Learning from Experience (LFE) is expected as part of any 'standard' project life cycle, this research has found no evidence of workplace learning over and above the previously mentioned '6+4' training enshrined in corporate policy. There was certainly no evidence, for example, of structured and systematic 'on the job training' (Carbone 2004) nor for that matter 'intentional and systematic knowledge management' (Wenger, McDermott et al. 2002) within project teams and in the workplace more generally. However, this research has found that the influence of the team in shaping how students worked, although initially high, reduced significantly over time and did not play a major part in shaping the way in which work was done (RF13). The role of teams, therefore, in shaping, facilitating and sharing learning was not evident, and reference to, for example, 'team based events' were very few and far between, and none had the explicit objective of 'learning'.

This was on the one hand somewhat surprising, and on the other rather disappointing. It is in stark contrast, for example, to the work of Cooke-Davis (2010) who reports that, in a sample of organisations drawn from a range of business sectors, those that performed more effectively were found to invest heavily in team development. One high scoring organisation was found to spend 40 per cent of a very considerable budget on activities to develop the effectiveness of project teams, reasoning "that since all projects are delivered by teams it is not very sensible to spend the lion's share of the training budget on developing individuals" (2010: 17).

Related to this, Lave and Wenger (2002) make very clear the importance of 'social engagement' to provide the proper context for learning to take place. Again, there is no evidence of such a 'healthy' and appropriate level of social engagement. Lave and Wenger also refer to the important contribution that comes from the development and exploitation of Communities of Practice (CoP). Bredillet (2008) makes a similar point in stating that 'projects are learning places' and that project teams share many of the characteristics of

CoP. Again, Cooke-Davis (2010) found that an area where many organisations are currently working on is the interface between learning from experience, knowledge management and workforce development. Indeed "the highest scoring organisations spend considerable amounts of their budget on knowledge-sharing activities that are explicitly designed to improve education through understanding best practice, and to improve practice through sharing of experience" (2010: 17).

Bringing together as they do 'groups of people who share a concern, a set of problems or a passion about a topic' there is an obvious opportunity to leverage the CoP concept within, and across, defence projects – and certainly within the more mature parts of the MOD organisation such as DE&S. Here again, there is a distinct lack of evidence supporting any notion of a 'community' of project management practice within MOD. Indeed, the general thrust of the findings in this regard point in quite the opposite direction – with one exception: the SO2 community.

It was found that an 'SO2[114] community' does exist (RF23) and whilst the precise nature and extent of that community is not clear, findings indicate that it does serve the purpose of bringing together Army Majors in a way that appears to share and support learning through more effective handovers and more regular interchange and informal communication. There is evidence that the 'graduates' of TechET maintain contact in the work place and statements made by students suggest that this emerging 'alumni' considers itself to be distinct from others who have not completed this, or an equivalent training. However, conspiring against the stability and continuity of this emerging and fragile community are issues associated with 'SO2 handover' and staff 'churn' (RF25).

This research also found that senior managers (Team Leaders, Sponsors) did not appear to play a significant role in the way students' work was done (RF13). However, Eraut (2007) concluded that managers should have a major influence on workplace learning, and the role of senior managers is to develop a culture

[114] SO2 is the military rank Staff Officer Grade 2 – Army Major or equivalent.

of mutual support and learning. In that respect, there is believed to be a real (and as yet arguably unfulfilled) role for senior management to actively shape the MOD learning community and equip its members with the means, modes and mind-sets required for shared learning – an approach that fundamentally addresses the circle and avoids further tampering with the triangle (Senge 1994). This is a facilitative role for managers, not a directive one, and here again we might ask whether there is the management competence (or for that matter, the motivation) in the workplace to address such a need. This clearly exposes a weakness of the research insofar as the data collected did not include the views of senior managers – Team Leaders and Sponsors - and in that respect the picture presented here is arguably, an incomplete one that would benefit from further research as described in Chapter 6.

From the above, it can be seen that learning and the development of PM competence takes place at different levels – the individual, the project team and the wider community. Moreover, the barriers hindering or preventing the realisation of benefits from PM E&T also exist, not solely at the level of the individual, but also at the level of the team or the wider organisation. Berggren and Sodurland (2008) defined three 'learning spaces' as being the individual, the team and the company. Bredillet (2008) proposes a similar model comprising three sets of learning objectives: individual, team and organisation.

In Chapter 2 Section 2.5.5, Table 2.1 was presented in the context of 'modes of learning' relating to project management education, training, working and learning. The table is repeated below as Table 5.2 below (page 133) but here, the cells have been annotated with appropriate summary statements for each of the modes of learning based on the research findings. It can be seen that the contribution to, and effectiveness of learning varies across the three levels of individual, team and organisation and again, there is very little evidence (RF9) that neither the 'team' level nor the 'organisation' play an active role in facilitating and supporting learning in a measured, structured and strategic way. That said, it is a weakness of the study that stakeholders from these other 'spaces' were not consulted or involved to further validate this finding.

	Individual	Team	Organisation
Reflection	***Individual reflection**: Students reflected on purpose and benefits of learning as part of their PM E&T*	***Experience sharing:** Some evidence that these activities took place but not universal, not regular nor significant in terms of changes realised.*	***Organisation dialogue:** No evidence of effective organisational dialogue over and above standard statements of policy relating to training days.*
Action	***Individual action:** Students contributed to individual action in undertaking E&T aligned to their specific job related responsibilities.*	***Teamwork:** Evidence of collaborative working to deliver joint work products but significant barriers (behaviours and local practices) prevent realisation of full benefits..*	***Organisational action:** Action predominantly in the form of funded training aimed at the individual and directives regarding training policy.*

Table 5.2 Modes of Learning in Project Management Education: *Research Findings*
(adapted from Berggren and Sodurland 2008: 290)

Stacey (2001) refers to the need to establish policy and practice around the management of knowledge as a process – working to ensure that organisational policy and practice build and support, rather than disrupt relational patterns between people that then damage knowledge generating capacity. Within the MOD the situation with regards to organisational policy, structure and culture is very complicated which adds to the challenge identified by Stacy of dealing with knowledge as an 'organisational asset'. The multiple[115] Top Level Budget (TLB) structures cut across – and at times even work against - project structures (RF11). In addition, there is not a single culture, but arguably several possible cultures including the military culture (with sub-cultures for each armed force), civil service, functional (finance, commercial) and project.

In a similar way, Pappas (2005) highlights the need for 'integration management' to bring into play actors from other parts of the business such as human resources and quality. This research has found (RF14) that there are issues associated with the level of integration and involvement that currently exists in connection with MOD Commercial and Finance functions. These functions are seen to be physically, organisationally and cognitively outside of the projects and acting in ways that are generally not aligned to project activity.

[115] The total defence budget is allocated across eight Top Level Budget Holders. These TLBs executives are then able to fund their own business areas within the budget allocated. DE&S is one such TLBs within the MOD. Project teams can and often do involve people from different TLBs.

A final finding relates to MOD investment in PM E&T. Although it was found that students generally believed that the MOD do not invest enough in PM E&T (F26) there was at the same time evidence to indicate that the majority of students did not require, nor undertake, any further PM specific E&T. One interpretation of these findings, therefore, could be that the training options available (and these are considerable with a dedicated in-house consultancy providing a range of externally accredited project management training courses, including APMP and APM PQ) is not perceived to be of real value to students. In that respect, investment of a different kind may be regarded as being necessary. Several students made reference to 'team events' but there was no evidence to suggest that such interventions were standard practice. There was also no evidence of coaching or mentoring type activities. These may represent investment opportunities of a different kind to the traditional, qualification-specific type of interventions which currently dominate PM development within the MOD.

5.4 Chapter Five ~ Discussion: *Summary*

It has been found that there continues to be merit in traditional PM E&T, providing people with an awareness, a language and the core skills of project management. However, there is a need for a different approach to educating, training, working and learning in defence projects that better supports project delivery in what is a complex and dynamic environment. The barriers to the application of prior learning, and the creation of new learning opportunities that have been identified involve, and cut cross all elements of competence, at various levels of the organisation - not only knowledge and skills at the level of the individual which traditionally has been, and for the large part still remains the focus of PM E&T. Development initiatives that are built on these traditional elements alone are flawed and the returns on investments in such PM E&T will not be fully realised, principally as a consequence of factors beyond the control and influence of the individual. These factors concern the way people work, their behaviours and their relationships, and the very nature of the workplace itself – its community, management and leadership – as well as elements of corporate and HR policy (e.g. rewards systems).

The research has therefore found that whilst there are benefits from investment in PM E&T, there is evidence of the need to do more, though not necessarily, more of the same.

One student put it in these words:

> *While learning a great chunk of theory is fine, and the way we tend to do things now (and have done in the past) I feel that little and often is a better way to learn a new skill like Project Management. Work experience is paramount. Embedding someone in a team and then drip feeding them throughout their time with that team would have, in my opinion, great results.*
>
> Army Major 18

Based on the findings of this research, and accepting its limitations and weaknesses, investment in traditional approaches to project management education and training alone, without addressing the barriers identified and making the appropriate changes in the workplace will not give rise to the anticipated benefits. Efforts to improve 'organisational effectiveness' (Cooke-Davis), the quality and effectiveness of 'social processes' (Smith and Winter) through 'coaching and mentoring' (Carbone), organisational 'integration' (Pappas) enabled by the development of a culture of mutual support and learning (Eraut) and facilitated by a more structured and systematically led 'Community of Practice' (Lave and Wenger) all constitute timely opportunities for alternative and, this research would indicate, more appropriate investment in people and organisational development.

"In much wisdom is much grief:
and he that increaseth knowledge increaseth sorrow".

Ecclesiastes 1:18

CHAPTER SIX

CONCLUSIONS

6.1 Introduction

A fundamental assumption of the research was that the adoption and implementation of Project Management (PM) brings benefits to organisations as evidenced in the adoption of PM as 'core competence' within the MOD. The study, therefore, did not set about to make the case for PM, nor to determine whether or not PM as such improves project outcomes. The overarching aim of this research was to better understand the perceived contribution of Project Management Education and Training (PM E&T) at the level of the individual student, and then to explore the experiences of those individuals as they went on to work in a project environment within defence.

Two key areas of the literature were identified as being of particular relevance to this research aim, namely current approaches to the development of project management practitioners and consideration of organisational learning and learning in the workplace.

Following a review of this literature, the questions that the research then set out to answer were:

Q1. What are student views on the experience of their PM E&T?

Q3. What are the beneficial changes over time of PM E&T?

Q4. What are the barriers over time to the realisation of benefits from PM E&T?

Q4. What can MOD do to improve its return on investment from PM E&T?

In its search for meaning, the research adopted an interpretive, integrative epistemological position involving mixed methods and the use of both quantitative and qualitative data collection methods over a period of 18 months. The data set comprised an initial student population of 78 Army Majors who completed their PM E&T at the Defence Academy of the United Kingdom, Shrivenham, before taking up a range of roles in defence related projects within the UK Ministry of Defence. A summary of the Research Findings aligned to the Research Questions is presented in Table 6.1 below.

6.2 Summary of Key Findings

The characteristics of defence projects are such that whilst project management courses and qualifications have been found to make an important contribution to building elements of competence the findings of this study suggest that delivered in isolation, such interventions are considered to be inadequate on the basis of reports over 12 months from students' participation in PM E&T. The findings would be stronger if the views of other stakeholders had been included, but nevertheless, the nature of the challenges that MOD 'project people' face point towards the need for a broader front of development activity, focussing more on the 'soft' competence elements with a greater focus on the level of the team and wider (functional) organisation.

Alternative development activities must aim to address a range of other factors that have been found by this study and previous research (Lave and Wenger 1991; Crawford 2000, 2006; Smith and Winter 2005; Pollack 2006; Hartman 2008; Pellerin 2009; Cooke-Davis 2010) to hinder learning. Such factors include working practices of the team, the level of engagement and quality of relationships, project and functional structures, cross departmental interface management, intra-group dynamics and over time, organisational values and culture as well as elements of infrastructure and corporate policy.

Both the literature and the findings of this research point towards a common issue: *the need for an altogether more strategic approach to project management education, development and learning*.

RQ1. What are student views on the experience of their PM E&T?	RQ2. What are the beneficial changes over time of PM E&T?	RQ3. What are the barriers over time to the realisation of benefits from investment in PM E&T?	RQ4. What can MOD do to improve its return on investment from PM E&T?
RF1: Initial low level of familiarity with PM and what it means	RF9: Beneficial changes but overwhelmingly at the level of the individual and comprising knowledge and skills elements	RF14: Original perceptions of barriers: organisational structures and poor cross functional working	RF21: PM methods trying to be applied where they are not always appropriate
RF2: Majority had no prior PM E&T but recognised relevance	RF3. Views on RF3: Views on relevance of PM to work changed significantly and positively	RF15: Student perceptions of barriers to be expected were later confirmed.	RF22: Different levels of maturity across the MOD are not being acted on
RF4: Useful and helpful in developing own career options	RF10: Immediate benefit was opportunity to 'learn the language'	RF13: Influence of the team on student working was initially high but reduced over time; influence of senior managers not significant	RF23: No evidence of a true 'community of practice' but one emerging amongst SO2 ranks
RF5: Proved to be less use to student teams over time but utility to organisations remains high	RF11: Greater appreciation of the 'bigger picture' enabling contextualisation of learning	RF16: Slight increase over time in extent to which learning could be applied; majority not able to do so	RF24: No evidence of development of 'soft' elements of competence; shortcomings in leadership
RF6: All taught PM topics found to be useful but trend over time was downwards.	RF12: Ability to apply tools and techniques in a variety of situation across a range of roles	RF17: Main barrier: different approaches to doing project work and local work practices	RF25: 'Churn' and loss of continuity found to be disruptive and driving short term thinking
RF8: Gaps were found to exist relating to job specific skills and Mod context		RF18: Different levels of understanding of PM principles and practice across teams & functions	RF26: MOD do not invest enough in PM E&T but motivation to do so adversely affected by workplace
		RF19: Behaviours found to be a major barrier – existence of 'multiple cultures'	
		RF20: Infrastructure and set-up found to be a barrier but not major	

Table 6.1 Summary of Research Findings (RF) against Research Questions (RQ)

This requires a move away from periodic, skill-based interventions at the level of the individual to a paradigm where the same individuals are able to immerse themselves in active team-based learning as part of their day-job. Such learning must be reinforced – not ruptured - by the organisational 'pattern of relationships' and supported by an explicit attempt to better manage and integrate learning within day-to-day project work. The 'community of practice' concept provides project-centric organisations such as the MOD with a framework for the 'co-production of knowledge' as part of a systematic social process that goes beyond the knowledge and skill elements of competence to become embedded in attitudes, traits and motives at all levels of the organisation. However, further research in the defence context would be helpful to establish ways forward on these aspects including consideration of the views of a wider set of stakeholders.

One key approach could comprise a combination of individual, team and corporate development initiatives that cut across these levels and militate against the key barriers found in this research. In so doing, MOD could potentially build not just 'communities of practice' but real 'communities of learning'. Investment in PM E&T at the level of the individual must be positioned as part of a broader, and more strategic, development programme. We can look to more 'mature', project-based organisations whose business is about delivering commercial projects to paying customers to begin to see evidence of these kinds of development activities and ultimately the benefits in terms of improved project performance and organisational effectiveness.

In such organisations, the traditional approach of project manager development is not applied in isolation but in conjunction with other elements of competence development. The recently reported work of Cooke-Davis (2010) involving organisations[116] that included Shell, NASA, Rolls Royce and General Electric, found that the most effective of these organisations invested heavily in approaches that enhanced the value of class-room training through knowledge-

[116] It is perhaps worth noting that all eight of the organisations involved in this study employ more than 10,000 people and have revenues in excess of $10 Billion with none of them employing fewer than 50 full-time project managers and two of them more than 1000.

sharing activities, team based development activities and improving education through understanding best practice and improving best practice through sharing experience.

With such maturity comes recognition that project management competence comprises more than taught knowledge and skills. It involves 'growing' people with the appropriate motives, traits and attitudes – elements of competence that can be employed to shape recruitment policy and practice, and over time, and with appropriate educational interventions, be used to build a corporate project identity and culture. Such an approach would need to reflect the different maturity levels across the MOD, bringing together parts of the organisation in a development context as well as a delivery context.

It must be said that the Army does not seek to recruit project managers. Rather, one could argue that first and foremost, the Army looks to recruit leaders, able to execute military operations, with a range of technical skills, working with, and within an organisational construct that is based on values shaped by tradition, discipline, courage and military fortitude. These are not necessarily the same qualities and values needed for project practitioners to perform and excel in a project-centric, commercially driven environment. In the context of the MOD, therefore, transitioning learning from a 'battle-space' to a 'business-space' domain is likely to be all the more necessary.

This research in the context of defence has therefore confirmed what others have collectively concluded: that there is an overriding need – and a real opportunity – to better prepare people for, and subsequently manage learning in the project workplace. This suggests a more strategic approach to PM E&T is needed with engagement of the wider business leading to a reduction in the kinds of barriers to learning that this research has identified. Clearer articulation of the business case for people development, with greater clarity around learning objectives, the learning process and associated roles and responsibilities - championed by senior management – will improve the return on investment in people development.

It is interesting to note, that the overall highest scoring organisation reported on by Cooke-Davis (2010) employs a leading specialist in the field of assessing educational results whose role it is to ensure that learning outcomes link directly to business related performance indicators. This heralds a blueprint that would allow an organisation to move from competent people, to competent team, to a truly competent corporate.

6.3 Strengths and Limitations of the Research

In Chapter 3, the limitations of this research were described from a methodological perspective and included commentary on research reliability and validity. In presenting its findings, conclusions and recommendations, it is clearly important for the specific limitations of the research to be understood, whilst at he same time, making clear what are believed to be its strengths.

6.3.1 Strengths

- The study adopted a longitudinal methodology that involved data collection over a 12-month period, comprising three time points. This approach is generally considered to be inherently more reliable than cross sectional studies.
- Mixed methods – a combination of surveys and interviews – were used for data collection giving rise to both quantitative and qualitative data. The use of mixed methods is also generally regarded as being able to support more comprehensive evidence.
- Data collection used electronic, on-line surveys which overcame many of the issues associated with paper-based tools, and provided ease of both access and response to students in remote locations.
- Although interviews were conducted on a voluntary basis, the minimum number of interviews for each time point was achieved helped perhaps by the fact that most interviews were conducted at students' place of work.
- Sponsorship of the research by a 2* officer (Major General Chris Wilson) meant that an alternative communication channel to students was made available to the research via MOD Army Records in Glasgow.

- Physical proximity of the researcher to the original data set enabled early and effective action to be taken to maximise awareness and buy-in to the research.
- The researcher is confident that the risk of bias this introduced has been fully mitigated having worked in line with the ethical policy and standards expected of GSoE students.

6.3.2 Limitations

- The target sample of 78 students is unlikely to be representative of neither the British Army nor the MOD as a whole. Claims of generalisability across all Armed Forces, and for the MOD itself would clearly be unfounded.
- Specifically, the views of other important stakeholders such as employing managers, Team Leaders and Sponsors have not been considered and as such, the research arguably presents a uni-dimensional 'bottom up' perspective that is not altogether balanced with a top-down perspective.
- Participation in the research was voluntary and as a result, there is a risk of response bias towards those students more inclined to favour and / or support both the research process and its subject matter.
- The research suffered from a degree of attrition in respect of both the size of the data set and response rates. This inevitably impacts the validity and reliability of the research.
- Attempts to conduct an analysis of summary responses over time at the level of the individual were frustrated by the difficulties associated with unique identification in the context of confidentiality and privacy which was considered to be essential given the sensitive nature of the data collected. Analysis was eventually conducted on a 'whole group' basis with results aggregated and presented as a 'single whole-group view'. This inevitably leads to a lack of granularity around the experiences of particular and uniquely defined individuals which in turn prevents more detailed analysis of key issues identified.

- Whilst the same research approach could be applied to other E&T interventions the findings pertaining to this research must be regarded as situation specific.
- The research makes clear (see Section 1.2.3) the strong and personal interest of the researcher in the outputs of this work. As the academic responsible for the development and delivery of the subject PM E&T, there is clearly a risk that such proximity and vested interest may result in a less than completely objective analysis.

6.4 Significance of the Research

6.4.1 Theoretical Knowledge

This study is believed to be the first of its kind to be undertaken in the British military, at a time when the public eye and Government focus is increasingly on ensuring value for money when making investments in defence projects[117]. It is in this respect, an original piece of work, and one of only two social science research projects[118] funded in 2008-9 as part of the Defence Academy Directed Research Programme.

The research has also been well received by the project management professional and academic community as evidenced in the acceptance of a peer reviewed paper based on this research that was published and presented at the United States Project Management Institute Conference on Project Management Education and Research held in Washington DC in July 2010. The peer review of that paper acknowledged its interest and value contributing as it does to the relatively immature body of literature on the subject of learning in project based organisations.

The research and its findings were also presented and well received at the International Defense Educational and Acquisition Arrangement (IDEAA) Conference, held at the Defence Academy, Shrivenham in June 2010.

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[117] For example, the recently published Strategy for Acquisition Reform (2009) sets out the actions to be taken to ensure improvements in project performance. New performance targets will allow average annual cost increases of only 0.4% and average in-year slippage of just 0.8 months.

[118] The other study has recently completed looking at 'multidisciplinary networks' in the British Military.

Finally, the results of this research compare favourably and add to the work that has been published very recently (Cooke-Davis, 2010) based on benchmarking exercises conducted in the last quarter of 2009 with a number of major project-based organisations. To that end, the research findings support and align to 'leading edge thinking' around the development of a project-capable workforce and demonstrate the value of longitudinal methods in exploring related issues.

6.4.2 Professional Knowledge and Practice

The results of this research have been well received by the MOD and specifically, Brigadier Scott-Bowden, acting on behalf of Major General Chris Wilson. Its key findings were presented to Major General Alan Macklin, Director Programmes and Technology Group and MOD PM Skills Champion, in February 2010. As a result of those discussions, there are indications that its methods and approach may adopted to improve visibility of the benefits associated with other investments in education and training at the Defence Academy.

As a module manager teaching on a number of masters level courses[119] in project and programme management, the researcher is well placed to draw on the findings of this work in extending his own professional practice. Already, for example, the limitations of traditional PM E&T have been built into course materials that explore the utility (and shortcomings) of the professional Bodies of Knowledge (APM, PMI, P2M[120]). In addition, proposals for the development and delivery of workplace-based interventions are being discussed – centred on project specific 'boards' as the unit of delivery. This is undoubtedly a theme that will build over time with further reflection and study.

The research has also reinforced the need for greater consideration of the 'soft paradigm' in the materials that form part of the researcher's academic responsibilities and ideas to include greater coverage, consideration and

[119] These include MSc Programme and Project Management, MBA(Defence), MSc Defence Leadership and MSc Security Sector.

[120] Association for Project Management (APM) Project Management Institute (PMI) and Project and Programme Management (P2M) are alternative Bodies of Knowledge (P2M is from Japan) which now form the basis of a team exercise on a number of the researcher's M-level modules.

reflection relating to the behavioural issues are already feeding in to course development and design (especially in the case of the MSc Defence Leadership course). These developments will complement very well, the researcher's long standing interest in multi-cultural management where he already has a number of publications.

The researcher has recently been nominated 'project lead' for the re-fresh of the APM Body of Knowledge (6th Edition) 'Learning and Development' chapter to be published in 2011. This will allow the author to draw on some of the findings and recommendations of this research.

Finally, as a Fellow of the APM and an Accredited Assessor for APM qualifications, the researcher is in regular contact with project management practitioners and affiliated organisations and as such, will take every opportunity to raise the profile of this research, and its key findings, through further published papers.

6.5 Recommendations

The following recommendations are based solely on the findings of this research[121], and as such, are made in full view of the limitations of the study as previously described. They are included here in an attempt to point towards actions that, all other things being equal, have the potential to move the MOD in what is believed to be the right direction. The recommendations are:

1. A 'root-and-branch' review of the current Project Management Education, Training and other development courses and programmes within each of the MOD TLBs to determine the totality and variety of such initiatives. These may or may not be part of the respective HR strategies within these various areas. This information would then be used to develop proposals for a more coherent pan-MOD project management development (PMD) strategy which would be used in turn to shape the totality of future investment in people;

[121] Suggested topics for further research are described in Section 6.6.

2. Pending the development of the PMD strategy, an early reduction in the MOD investment made in PM E&T at the level of the individual (i.e. specific training courses) within the more mature TLBs (e.g. DE&S) in order to free up funding for greater investment in more regular, structured, team based, issue-driven learning interventions, involving representatives from Commercial and Finance. At the same time, a commensurate increase in the investment made at the level of the individual in less mature TLBs, specifically, Front Line Commands and the Capability Sponsor organisations;

3. Consideration of the development of a true PM Community of Practice (CoP) within MOD commencing with, and championed by, DE&S and including training of Team Leaders to raise awareness of the issues associated with learning in the workplace and to provide an initial impetus to the CoP initiative;

4. The creation of a 'PPM[122] Knowledge Manager' role, reporting to PPM Head of Profession, with terms of reference aimed at providing structure around workplace learning and ultimately taking responsibility for PPM related workplace learning principles, process and practice. Careful consideration would have to be given to how this individual interfaces with other functional areas within MOD.

6.6 Areas for Further Research

The above recommendations are likely to involve considerable investment of time, effort and indeed money, if they are to be well planned and implemented effectively. Prior to making such decisions and commitments, and given the limitations of this study, it could be argued that further research is necessary, if not essential to truly make the case for such changes. There are believed to be three areas of further research directly related to this work that could bring early and potentially significant benefit and provide confidence in moving forward. These are:

1. An extension to this study, with a similar set of Research Questions, but aimed at students participating in the the successor PM E&T course to TechET namely, Acquisition Employment Training (AET);

[122] PPM: Project and Programme Management given the interdependency between these two disciplines.

2. New research to investigate 'ground level' project management practices within DE&S as the major project-centric TLB with a specific focus on learning in the workplace and the potential contribution to learning arising from team development and a more explicit Community of Practice approach; and
3. Longer term research into the correlation between the extent of adoption of Project Management practices and resulting project performance to determine the degree to which adoption of 'process' enables delivery of 'outcomes'.

None of these suggestions are without some degree of risk of disruption to the business, already stretched at a time of very high operational tempo and faced with the reality of a Strategic Defence Review that itself will require major adjustments in working practices and priorities.

The first of these recommendations is lowest risk, and the researcher has already engaged with Director, Programmes and Technology Group being the (2*) individual responsible for the development of PPM practice and standards through his remit as PPM Skills Champion. The AET course is conducted on a more frequent basis, with a greater number of students than was the case with TechET and in that respect, it could provide increased reliability and validity that that provided by this research, especially if the views of a wider range of stakeholders are additionally included. This may lead to funded work during 2011-12.

The second recommendation, involving as it does new research into 'ground level' PM practices, would require careful planning if disruption to the workplace and associated impacts and issues are to be minimised. There is also a risk that it is seen as a further change initiative at a time when many believe the MOD, and specifically the DE&S organisation is 'changed out'. Nevertheless, this work would have considerable merit, addressing as it could, a number of the weaknesses and limitations of this study. An approach that might reduce or avoid the issue of 'change overload' would be to conduct a limited 'pilot' cross sectional study. DE&S comprises a number of Operating Centres each with their own portfolios of projects and programmes.

This work could therefore be focussed on a single Capability Area within one Operating Centre, with the unit of analysis being a project, or programme within that Area, and the data set essentially comprising the team(s) and associated functions including Team Leader(s) and Sponsor(s). Whilst the results of such a pilot may not be representative, it would certainly provide further evidence of the extent and nature of any issues and opportunities that exist in respect of learning in the workplace and the potential contribution to learning arising from team development and a more explicit Community of Practice approach.

The third and final recommendation would support work done by others into the value of project management in different employment contexts. The work of Thomas and Mullaly (2008) looking as they did into the value of project management to organisations was a seminal study of this question involving several tens of researchers over a number of years. It is unclear whether an MOD-specific study would generate fundamentally new understanding but would contribute further evidence in an area with so far limited research evidence. The success of Urgent Operational Requirement (UOR) projects might provide a starting point unique to defence, albeit on a much smaller scale. One, or a small number of such projects, could provide the unit of analysis as a basis for investigating the extent to which the adoption of PM principles and process was found to improve, or contribute towards, project effectiveness and success.

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Appendix A
Letter of Support from Sponsor – Major General Chris Wilson CBE

From Major General C C Wilson CBE
Capability Manager (Battlespace Manoeuvre)

Ministry of Defence
2nd Floor, Zone F, Main Building,
Whitehall, LONDON SW1A 2HB
Telephone: (020) 7218 2706 - Facsimile: (020) 7218 7850
E-Mail:chris.wilson695@mod.uk

CM(BM)/2/3

I am writing to you to introduce a Cranfield University research project that involves you and your Technical Employment Training (TechET), and to encourage your participation and support.

The overall aim of the research is "*to ascertain the perceived contribution of project management education and training, primarily, but not only, Technical Employment Training, to the successful delivery of Army-focussed defence projects and to determine the barriers, if any, that may frustrate, or possibly prevent, the realisation of benefits from such interventions*".

The research will focus on the experiences of cohorts 4a (May 2008) and 4b (September 2008) prior to being 'posted' and will run over an 18 month period starting in course and continuing on as you make the transition to and subsequently work in post. Data will be collected using a mix of methods that will include questionnaires, semi-structured interviews and telephone interviews.

Of course, projects are not delivered in isolation and the benefits from education and training must be realised within the context of a wider, MoD environment. The research will want to understand, amongst other things, what impact, if any, that environment has on MoD project performance.

I believe this to be a useful piece of work and one that deserves your support.

Appendix B

Technical Employment Training (TechET): *A Brief Description*

Introduction

Technical Employment Training (Tech ET) provides students with the essential theory and practical skills necessary to perform effectively within the Military Acquisition Stream (MAS) in the MOD acquisition community. During the course students are provided with an understanding of the common methodologies, tools and techniques used by effective Project Managers, Requirements Managers and Through Life Support Managers. On successful completion of the course students will have obtained 20 Masters level credits from Cranfield University, the Association for Project Management APMP qualification (IPMA Level D) and a series of common skills on which role specific training can build.

Aim

To prepare selected core staff for project related appointments within the MOD acquisition community by applying a common understanding of the skills and processes required in the delivery of capability through all stages of the life cycle process.

Course Structure

There are two phases to the course.

- Phase One is a four week package that explains the skills and processes required for successful Project Management and Systems Engineering with special emphasis on MoD acquisition. A series of linked case studies will practise the students in the processes and documentation at all stages of the MOD Project Lifecycle: CADMID lifecycle, including a Warehouse project simulation. This part of the course culminates with students sitting the APMP examination.

- Phase Two involves the application of the skills learnt in Phase One. During this phase the students will be placed into Requirements Working Groups to research and report on a 'real' capability issue sponsored from within the MoD.

Assessment

- A 2 hour M Level exam in Project Management.
- The APMP exam.

Designed for

Tech ET is designed as the foundation course for military officers working within all areas of the UK MOD project, procurement and acquisition community.

Appendix C
Sample of an on-line survey

Project Management education and training in the British Armed Forces: Baseline_4a Results

Survey Overview

Number of respondents: 33
Response rate: 60.0%
Launch date: 09 Jun 2008

Expected number of respondents: 55

Close date: 10 Jul 2008

Section 1: Maintaining Contact

1. *Do you give permission for* personal contact details held centrally to be used to keep in touch with you in the future?			
Yes:		84.8%	28
No:		15.2%	5

2. Do you have an alternative email that you can let me have to be able to contact you in future? If so, please add it in the box below.

View All Responses - There are too many responses to display on this page and so all the responses to this question are available on a separate page.

3. Do you have a telephone number that I could use as an alternative? If so, please add it here.

View All Responses - There are too many responses to display on this page and so all the responses to this question are available on a separate page.

Section 2: The following details are intended to allow a better understanding of the cross section of the students undertaking TechET.

4. Which of the following applies to you?			
Army:		100.0%	33
RN:		0.0%	0
RAF:		0.0%	0
Civil Servant:		0.0%	0

5. What is the context of your attendance at TechET?			
I am attending Stage 1 & Stage 2 before going to post:		33.3%	11
I am attending Stage 1 only as part of BTC:		63.6%	21
I am attending Stage 1 only as part of another course:		3.0%	1

Appendix C

Sample of an on-line survey

6. What is your age?			
<30:		0.0%	0
30 - 35:		87.9%	29
36 - 40:		0.0%	0
41 - 45:		12.1%	4
>45:		0.0%	0

7. What is your gender?			
Male:		97.0%	32
Female:		3.0%	1

Section 3: Prior knowledge and experience of project management

8. How familiar with the subject of **project management** were you *before* embarking on TechET? *Please mark that which best reflects your own position.*			
Very familiar with the discipline and what it entails:		3.0%	1
Fairly familiar with the discipline and what it entails:		42.4%	14
Familiar with the term but not clear on its meaning:		51.5%	17
Unfamiliar with the term and its meaning:		3.0%	1
Totally unaware of the subject:		0.0%	0

9. What project management **education and training** had you received prior to attending TechET?			
None at all:		n/a	20
Some introductory studies e.g. as part of a first degree:		n/a	5
PRINCE2 Foundation:		n/a	1
PRINCE2 Practitioner:		n/a	0
APM Foundation Certificate:		n/a	0
APMP:		n/a	0
PMI Practitioner:		n/a	0
Other *(please specify)*:		n/a	10

View All Responses - There are too many responses to display on this page and so all the responses to this question are available on a separate page.

Appendix C
Sample of an on-line survey

10. How relevant to your **military career** did you consider the **subject of project management** to be *before* embarking on TechET? *Please select the answer that best reflects your view.*			
Extremely relevant - an essential discipline for my future:		6.1%	2
Very relevant - a useful discipline for me to fully understand:		30.3%	10
Fairly relevant - a useful discipline for me to be aware of:		51.5%	17
Not really relevant - but was interested for other reasons:		9.1%	3
Not at all relevant - and I was not interested in the subject:		3.0%	1

11. How relevant to your **military career** did you consider **the TechET course** to be *before* starting the course?			
Extremely relevant:		12.1%	4
Very relevant:		33.3%	11
Fairly relevant:		48.5%	16
Not relevant:		*3.0%*	*1*
I was not able to judge how relevant the course would be:		3.0%	1

Section 4: Your experience of the TechET course			
12. Think about the project management topics taught on **TechET Stage 1**. How useful and relevant do you believe these to be in terms of your immediate military career?			
12.a. Introduction to the PM Profession -- How useful was this topic?			
Very useful:		12.1%	4
Useful:		72.7%	24
A Little:		15.2%	5
Not at all:		0.0%	0
12.b. Awareness of PM terminology -- How useful was this topic?			
Very useful:		24.2%	8
Useful:		63.6%	21
A Little:		12.1%	4
Not at all:		0.0%	0
12.c. The Lifecycle approach -- How useful was this topic?			
Very useful:		39.4%	13
Useful:		45.5%	15

A Little:		15.2%	5
Not at all:		0.0%	0
12.d. Investment Appraisal -- How useful was this topic?			
Very useful:		30.3%	10
Useful:		66.7%	22
A Little:		3.0%	1
Not at all:		0.0%	0
12.e. Project Scheduling -- How useful was this topic?			
Very useful:		27.3%	9
Useful:		60.6%	20
A Little:		9.1%	3
Not at all:		3.0%	1
12.f. Resource Management -- How useful was this topic?			
Very useful:		21.2%	7
Useful:		63.6%	21
A Little:		12.1%	4
Not at all:		3.0%	1
12.g. Risk Management -- How useful was this topic?			
Very useful:		48.5%	16
Useful:		42.4%	14
A Little:		9.1%	3
Not at all:		0.0%	0
12.h. Estimating -- How useful was this topic?			
Very useful:		9.1%	3
Useful:		69.7%	23
A Little:		21.2%	7
Not at all:		0.0%	0
12.i. Budgeting & Cash Flow -- How useful was this topic?			
Very useful:		21.2%	7
Useful:		51.5%	17
A Little:		24.2%	8
Not at all:		3.0%	1
12.j. Earned Value Management -- How useful was this topic?			
Very useful:		18.2%	6
Useful:		57.6%	19
A Little:		24.2%	8
Not at all:		0.0%	0
12.k. The Warehouse Simulation -- How useful was this topic?			

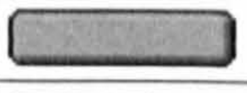
Appendix C
Sample of an on-line survey

Very useful:		30.3%	10
Useful:		27.3%	9
A Little:		27.3%	9
Not at all:		15.2%	5
12.l. Project Organisation & Structures -- How useful was this topic?			
Very useful:		18.2%	6
Useful:		60.6%	20
A Little:		18.2%	6
Not at all:		3.0%	1
12.m. The APMP Course -- How useful was this topic?			
Very useful:		36.4%	12
Useful:		39.4%	13
A Little:		21.2%	7
Not at all:		3.0%	1

13. Overall, how **useful** and **relevant** do you think **TechET (Stage 1)** has been to your immediate military career?			
13.a. Useful?			
Very:		36.4%	12
Some:		42.4%	14
A Little:		21.2%	7
Not at all:		0.0%	0
13.b. Relevant?			
Very:		34.4%	11
Some:		50.0%	16
A Little:		15.6%	5
Not at all:		0.0%	0

14. Reflecting on your overall experience of TechET (Stage 1), what personal changes has the course helped with, or contributed to in terms of, for example, your attitude, behaviours, outlook, skills, competence etc.? *(Please list - or otherwise state 'none').*

View All Responses - There are too many responses to display on this page and so all the responses to this question are available on a separate page.

15. What other influences - over and above the 'class-room' training itself - have changed how you think about projects and your approach to project-related work?			
Discussing as a syndicate:		n/a	15
Networking opportunities:		n/a	10
Developing your 'soft' skills:		n/a	0
Seeing how industry		n/a	26

operates:			
Thinking about the 'bigger picture':		n/a	12
Nothing comes to mind:		n/a	3
Other *(please specify)*:		n/a	5

View All Responses - There are too many responses to display on this page and so all the responses to this question are available on a separate page.

16. How useful do you believe the TechET course will prove to be **for you** in respect of each of the following?			
16.a. Your next posting?			
Very useful:		33.3%	11
Useful:		57.6%	19
Of Little Use:		9.1%	3
Of No Use:		0.0%	0
16.b. Your medium term military career?			
Very useful:		27.3%	9
Useful:		57.6%	19
Of Little Use:		6.1%	2
Of No Use:		9.1%	3
16.c. Your longer term professional development?			
Very useful:		39.4%	13
Useful:		42.4%	14
Of Little Use:		12.1%	4
Of No Use:		6.1%	2

17. Overall, how useful do you believe TechET will be for the **the organisations** in which you will work in the future?			
17.a. Your next posting's project team?			
Very Useful:		27.3%	9
Useful:		57.6%	19
Of Little Use:		12.1%	4
Of No Use:		3.0%	1
17.b. The MOD in general?			
Very Useful:		21.2%	7
Useful:		63.6%	21
Of Little Use:		15.2%	5
Of No Use:		0.0%	0
17.c. Any future employer beyond the MOD?			
Very Useful:		31.2%	10

Appendix C
Sample of an on-line survey

Useful:		59.4%	19
Of Little Use:		6.2%	2
Of No Use:		3.1%	1

18. Based on what you know of your next job, please describe any gaps that you believe exist in the current TechET course that should be closed as a matter of priority for any future TechET course. *(Please list - or otherwise state 'none').*

View All Responses - There are too many responses to display on this page and so all the responses to this question are available on a separate page.

Section 5: Going Forward

19. What type of project role will you be moving to after TechET?

DEC Staff:		27.3%	9
IPT Project Staff:		9.1%	3
IPT ILS Staff:		0.0%	0
IPT RM:		18.2%	6
FLC:		9.1%	3
R&D:		6.1%	2
MA/COS:		12.1%	4
Other *(please specify)*:		18.2%	6

View All Responses - There are too many responses to display on this page and so all the responses to this question are available on a separate page.

20. Now that you have completed TechET Stage 1, what is your *perception* of how relevant project management will be to your future military career?

Extremely relevant - an essential discipline for my future:		21.2%	7
Very relevant - a useful discipline for me to fully understand:		60.6%	20
Fairly relevant - a useful discipline for me to be aware of:		18.2%	6
Not relevant - but I am still interested for other reasons:		0.0%	0
Not relevant - and I remain unconvinced of its value:		0.0%	0

Appendix C
Sample of an on-line survey

21. What is your level of interest in learning more about the subject of project management as a result of your experience of TechET?			
Very interested - I will search out opportunities to do more:		36.4%	12
Interested - if the opportunity arose I would happily take it:		36.4%	12
Interested - I would do more if my job required me to do it:		12.1%	4
Not really interested - depending on the situation at the time:		15.2%	5
Not at all interested:		0.0%	0

Section 6: Helping Further

22. Would you be available for a brief follow-up interview?			
Yes, no problem:		75.8%	25
No thanks:		24.2%	8
22.a. If 'Yes' please indicate your preferred method for me to make contact with you and add the appropriate details (telephone number, email address) in the box below.			
Telephone:		16.0%	4
Email:		28.0%	7
Other *(please specify)*:		56.0%	14

View All Responses - There are too many responses to display on this page and so all the responses to this question are available on a separate page.

APPENDIX D:
List of Surveys conducted

Survey Title	Status	Launch Date	Closing Date	Responses received
Project management education and training in the British Army: Baseline_Pilot_Sally	Closed	2008-05-13	2008-05-19	1/1
Project management education and training in the British Army: Baseline_Pilot	Closed	2008-05-20	2008-05-29	3/10
Project management education and training in the British Armed Forces: Baseline_4a_Revised Pilot	Closed	2008-05-30	2008-06-08	0/0
Project Management education and training in the British Armed Forces: Baseline_4a	Closed	2008-06-09	2008-07-10	33/55
Project Management education and training in the British Army: Baseline 4b_DSPilot	Closed	2008-09-03	2008-09-19	1/6
Project Management education and training in the British Army: Baseline_4b	Closed	2008-09-18	2008-10-23	18/23
Project Management education and training in the British Army: 1st Review_Course4a_NBTC_Pilot_Sally	Closed	2008-09-23	2008-10-23	1/1
Project Management education and training in the British Army: 1st Review_Course4a_NBTC_Pilot	Closed	2008-10-30	2008-11-27	1/0
Project Management education and training in the British Army: 1st Review_Course4a_NonBTC	Closed	2008-12-05	2009-03-31	12/18
Project Management education and training in the British Army: 1st Review_Course4aBTC_&_Course 4b	Closed	2009-04-06	2009-06-03	25/57
Project Management education and training in the British Army: 2nd Review_Course4a_NonBTC	Closed	2009-06-21	2009-09-25	9/18
Project Management education and training in the British Army: 2nd Review_Course4aBTC_&_Course4b	Closed	2009-09-25	2009-12-04	18/57

Appendix E:
Interview Consent Form

Consent Form

Project Management Education & Training in the British Army

The overall aim of the research is to ascertain the perceived contribution of project management education and training to the successful delivery of defence projects and to determine the barriers, if any, that may frustrate, or possibly prevent, the realisation of benefits from such interventions.

Research data collection involves both survey and semi-structured interviews. The interviews are centred around a set of standard questions and all interviews are taped with the permission of the interviewee.

Please tick each box:

I have been informed of the nature and objectives of the research ..... ☐

I understand that my participation is voluntary and that I free to withdraw at any time..... ☐

I understand that this interview will be recorded and that the data collected will be stored on computer, and that any files will be made anonymous..... ☐

I have been assured of anonymity and hereby grant permission to Bill Egginton to use statements I may make in the course of interviews **on the sole condition** they are presented in an anonymous and unattributed way..... ☐

I understand that this permission does not compromise my rights under the Data Protection Act..... ☐

Signed:

Name (please print):.....

Date:

Thank You.

Bill Egginton
Cranfield University

Appendix F:
Interview Pro forma

PM Education & Training in the British Army

Baseline Interview Pro-Forma

Name:

Date:

Qu.1 Overall, how did you find TechET Stage 1?

Qu.2 Was TechET what you expected or different?

Qu.3 Has there been a change in your perception of the **relevance** of Project Management to your military career as a result of TechET/

And the **usefulness** of PM as a result of TechET?

Qu. 4 What do you believe might be the benefits of TechET and specifically PM training in your next post?

Qu.5 Can you envisage any difficulties in applying what you have learned?

Qu.6 What personal changes – if any – have taken place over the past 4-6 weeks – how you think about work, the approach to projects, understanding of MOD as a customer etc.?

Qu.7 What 3 things do you most hope to be in place to allow you to do your job properly?

Qu. 8 What 3 things do you think might most hinder your project related work in the future?

Qu.9 Would you be happy to be part of the ongoing process?

Qu.10 I want to be sure we can keep in touch – will you do what you can to help me?

Thanks Very Much!

APPENDIX F:
Interview Pro forma

PM Education & Training in the British Army

Initial Review ~ Interview Pro-Forma

Name:

Date:

Qu.1 Has your perception of the relevance to PM changed over the last 6 months? If so, how has it changed?

Qu.2 Can you think of any examples where what you learned about PM has helped you in your work?

Qu.3 Have any specific elements of the PM BoK been more useful than others? If so, why?

Qu. 4 Has it been easy applying what you have been taught about PM? If not, why not?

Qu.5 Can you think of any specific examples where you have 'hit a barrier' in trying to apply what you have learned?

Qu.6 If you could change three things about your workplace to make project work more effective, what three things would you change?

Qu.7 Did you find what you had hoped for when you arrived in post? (If not, why not?)

Qu. 8 Have you found any surprising positives in the workplace? If so, what are they?

Qu.9 Would you be happy to be part of the ongoing process?

Qu.10 I want to be sure we can keep in touch – will you do what you can to help me?

Thanks Very Much!

APPENDIX F:
Interview Pro forma

PM Education & Training in the British Armed Forces

Final Review ~ Interview Pro-Forma

Name:

Date:

Qu.1 Over the past 12 months, what changes have occurred as a result of your PM E&T?

- for you
- for your team
- for your wider organisation

Qu.2 Have you found that working with a project approach based on your E&T has been supportive of local ways of working or disruptive?

Qu.3 Have you had to adapt to local ways of working? Can you give examples? Has this been overall positive or negative?

Qu. 4 What other influences apart from your PM E&T have shaped the way work gets done in your area?

Qu.5 What have been the benefits as a result of your PM E&T over the past 12 months? To you / your team / the organisation?

Qu.6 What aspects of your E&T have been most useful – any specific examples – has it in general been the hard or soft skills?

Qu.7 What kinds of barriers have you encountered in applying your learning?

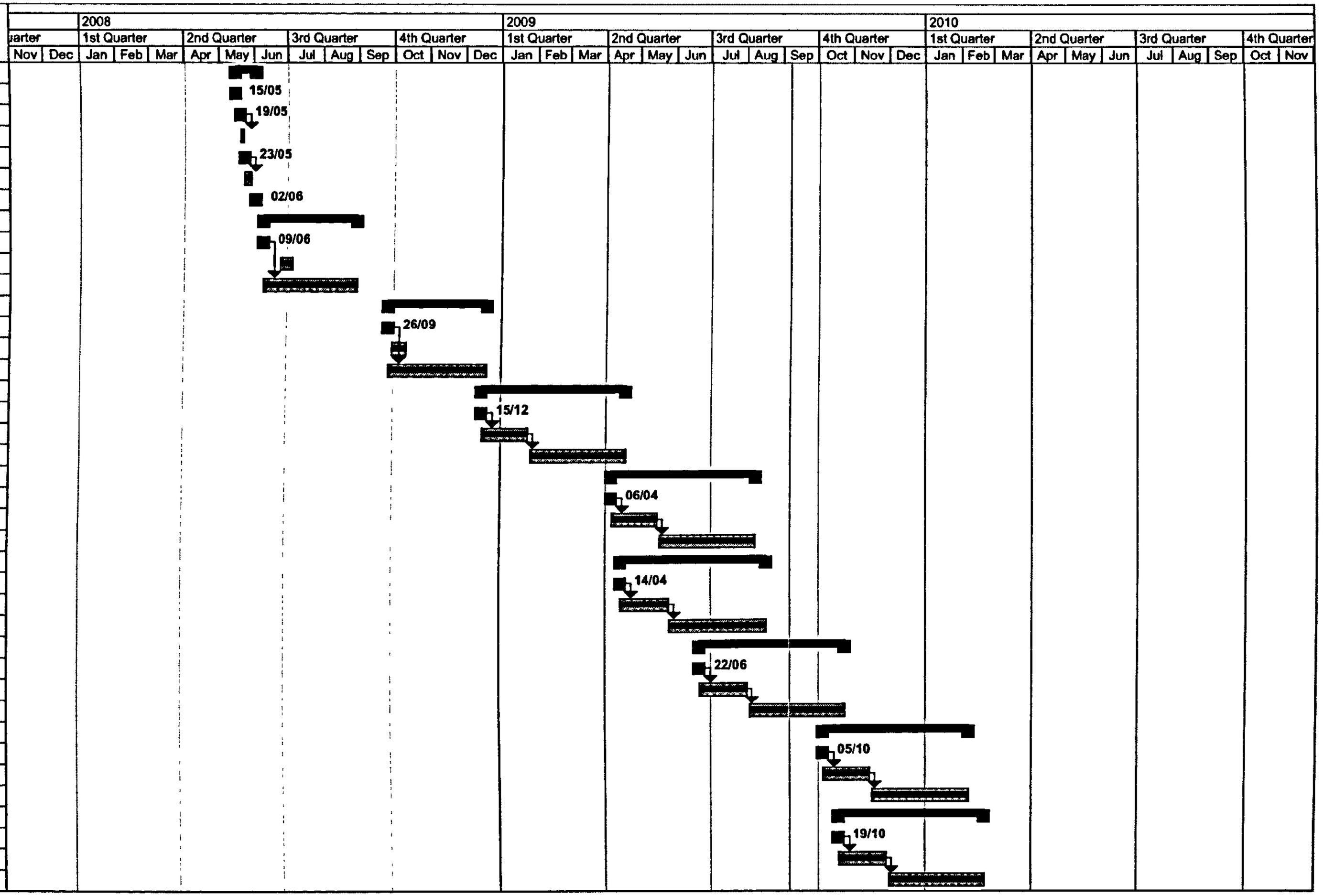
Qu. 8 Can you give any examples of barriers or hindrances you've encountered?

Qu.9 As CEO of MOD plc – what THREE changes would you make to better realise return on investments in E&T?

Thanks Very Much!

APPENDIX G:
Research Project Schedule of Activities

ID	Task Name
1	**Pilot Survey**
2	Survey Question Review
3	Issue Pilot to GSoE
4	Review Comments & amend
5	Issue Pilot to Military Staff
6	Review Comments & amend
7	Issue amended Pilot
8	**4a Baseline (BTC & Non_BTC)**
9	Issue Baseline 4a to Students
10	Conduct 4a baseline Interviews
11	4a baseline Data Analysis
12	**4b Baseline (Non BTC Only)**
13	Issue Baseline 4b to Students
14	Conduct 4b baseline Interviews
15	4a baseline Data Analysis
16	**4a NBTC First Review (FR_4aNBTC)**
17	Issue Survey FR_4aNBTC
18	Conduct FR_4aNBTC Interviews
19	FR_4aNBTC Data Analysis
20	**4a BTC First Review ((FR_4aBTC)**
21	Issue Survey FR_4aBTC
22	Conduct FR_4aBTC Interviews
23	FR_4aBTC Data Analysis
24	**4b First Review (FR4b)**
25	Issue Survey FR_4b
26	Conduct FR_4b Interviews
27	FR_4b Data Analysis
28	**4a NBTC Second Review (SR_4aNBTC)**
29	Issue Survey SR_4aNBTC
30	Conduct SR_4aNBTC Interviews
31	SR_4aNBTC Data Analysis
32	**4a BTC Second Review (SR_4aBTC)**
33	Issue Survey SR_4aBTC
34	Conduct SR_4aBTC Interviews
35	SR_4aBTC Data Analysis
36	**4b Second Review (SR4b)**
37	Issue Survey SR_4b
38	Conduct SR_4b Interviews
39	SR_4b Data Analysis



Appendix H:
Methodology: Lessons Learned

A longitudinal methodology has strengths which, some argue, are lacking in standard cross-sectional designs (See Section 3.5.4 for details of this argument). However, this approach does have its challenges, especially when part of a part-time course of study. Needless to say, it was in this area of the research methodology that the key lessons were learned. These are reflected here for the record.

Lesson 1: Get Systematised: Any longitudinal study is likely to throw up a lot of data. This needs careful organisation and a system – hard copy, spreadsheet, diary based, or in the case of this research all three – if the task is to be manageable with the day job happening at the same time.

Lesson 2: Start before the Start: Trying to pre-empt issues associated with data collection, storage, retrieval and analysis before they happen will save a lot of pain. It is practically impossible to go back and repeat so 'right first time' is essential. Thorough and repeated piloting of surveys is a must.

Lesson 3: Know your Data Set: The collection of data over time, when the make-up of that data set may move, change, ebb and flow means that it is important to characterise (within the boundaries of ethical practice) the individual records at the start and throughout. Keep Unique IDs unique.

Lesson 4: Keep Knowing It: Reliance on single data fields (e.g. a Unique ID) may not be sufficient. Build in additional descriptors (e.g. emails) to allow the identification of individual cases if the intention is to track at the level of the individual. Invest in more sophisticated tools if the data set is large (>100).

Lesson 5: Be Realistic: Longitudinal studies inevitably suffer attrition both in data set size and response rates. Any assumptions made in connection with the type and extent of data analysis must be realistic and systems sufficiently flexible to allow for such changes. Managing the expectations of Sponsors and Supervisors when faced with these kinds of risks is key.